CALIFORNIA HIGH-SPEED TRAIN

Program Environmental Impact Report/Environmental Impact Statement

Sacramento to Bakersfield

TRAFFIC, TRANSIT, CIRCULATION & PARKING TECHNICAL EVALUATION

January 2004

Prepared for:

California High-Speed Rail Authority

U.S. Department of Transportation
Federal Railroad Administration

CALIFORNIA HIGH SPEED RAIL AUTHORITY

U.S. Department of Transportation
Federal Railroad Administration

CALIFORNIA HIGH-SPEED TRAIN PROGRAM EIR/EIS

Sacramento to Bakersfield
Traffic, Transit, Circulation & Parking
Technical Evaluation

Prepared by:

Fehr & Peers Associates

3685 Mount Diablo Boulevard, Suite 301

Lafayette, California 94549

In Association with

DMJM+HARRIS

EIP Associates

January 2004

TABLE OF CONTENTS

APPENDICES

A. STATION AREA AND AIRPORT AREA GRAPHICS
B. STATION AND AIRPORT AREA TRIP GENERATION
C. STATION AREA TRAFFIC IMPACT DETAILS
D. AIRPORT AREA TRAFFIC IMPACT DETAILS
E. INTERCITY TRAFFIC IMPACT DETAILS
F. CORRIDOR AND DESIGN OPTIONS FOR HIGH-SPEED TRAIN ALTERNATIVE

LIST OF FIGURES

APPENDIX FIGURES

LIST OF TABLES

LIST OF ACRONYMS

ACE	Altamont Commuter Express
ADT	Average Daily Traffic
AFB	Air Force Base
Authority	California High-Speed Train
BFL	Bakersfield Meadows Field Kern County Airport
CBD	Central Business District
CEQA	California Environmental Quality Act
COG	Council of Governments
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
FAX	Fresno Area Express
FYI	Fresno Yosemite International Airport
GET	Golden Empire Transit District (Bakersfield)
HCM	Highway Capacity Manual
HST	High-Speed Train
LOS	Level of Service
KART	Kings Area Rural Transit
Km/h	Kilometers per Hour
MACOG	Modesto Area Council of Governments
MAX	Modesto Area Express
MCE	Merced Municipal Airport
MOD	Modesto City-County Airport
MPH	Miles per Hour
MPO	Metropolitan Planning Organization
MTA	Metropolitan Transportation Authority
NEPA	National Environmental Protection Act
PCE	Passenger Car Equivalency
RTD	Regional Transit District
RTP	Regional Transportation Plan
SACOG	Sacramento Area Council of Governments
SACRT	Sacramento Regional Transit District
SJRTD	San Joaquin Regional Transit District
SJVGMS	San Joaquin Valley Goods Movement Study
SMART	Stockton Metropolitan Area Fixed Route Service
SMF	Sacramento International Airport
SR	State Route
STARTS	Stanislaus Regional Transit
STIP	State Transportation Improvement Program
V/C	Volume-to-capacity
VIS	Visalia Municipal Airport
YARTS	Yosemite Area Regional Transportation System

1.0 INTRODUCTION

The traffic, transit, circulation, and parking analyses for this Program Environmental Impact Report/Environmental Impact Statement (EIR/EIS) presents a broad comparison of potential impacts of the Modal and High-Speed Train (HST) Alternatives to traffic, transit, circulation, and parking along intercity corridors and around rail stations and airports. Potential impacts for each of the alternatives are compared with the No-Project Alternative and to existing conditions.

The impact evaluation addresses automobile traffic and goods movement on intercity highways, as well as traffic, parking, and transit conditions at intermodal passenger transportation facilities. The analysis includes transportation facilities and highways that either: 1) serve as the primary means of access to proposed rail stations and airports, or 2) are major intercity highway routes serving the same destinations as the HST. In the future No-Project Alternative, the analysis considers formally planned and committed improvements to all modes of transportation other than HST. The HST Alternative adds the full high-speed train system to the No-Project Alternative. In the Modal Alternative, the analysis also considers, instead of HST, improvements and expansions to roadways and airports beyond those already planned by state and regional agencies.

Initial analysis identified potentially affected elements of the transportation system, including intercity and all modes of access to the station and airport areas. Once primary routes were identified, intercity highway screenlines and station-area cordons were delineated that combined segments of the primary routes at reasonable locations for evaluating the aggregate baseline traffic and public passenger transportation conditions. Using data and forecasts for 2002, 2020 morning (AM) peak hours (including information from the Metropolitan Planning Organization [MPO] regional travel models), baseline ratios of demand-to-capacity across each intercity highway screenline and station area/airport roadway cordon were established using the Transportation Research Board's *Highway Capacity Manual* standards.

Traffic related to new HST passengers traveling to/from the stations was added to the 2020 baseline volumes. Those diverted to HST from air travel were subtracted from airport-access traffic, and those diverted from intercity auto travel were subtracted from intercity highway screenlines.

Baseline 2002 and 2020 conditions were also characterized for goods movement (truck/freight) at critical locations in the study area and the effects of diverting intercity highway traffic to HST was evaluated for key goods movement means/corridors. Parking in the vicinity of the stations and airports was also analyzed based on 2002 parking reserves, local plans for major parking expansion, and adequacy of local parking codes for meeting No-Project growth in demand.

Summary tables presented in the following section identify impacts on highways and roadways (at the screenline level), public transportation services, goods movement, and parking facilities.

1.1 ALTERNATIVES (NO-PROJECT, MODAL, HIGH-SPEED TRAIN)

1.1.1 No-Project Alternative

The No-Project Alternative serves as the baseline for the comparison of the Modal and HST Alternatives (**FIGURE 1**). The No-Project Alternative represents the state's transportation system (highway, air, and conventional rail) as it existed in 1999-2000 and as it would exist after implementation of programs or projects currently programmed for implementation and projects that are expected to be funded by 2020. The No-Project Alternative addresses the geographic area serving the same intercity travel market as the proposed high-speed train (city-to-city travel within the Central Valley Region and to northern and southern California, and travel through the Valley from Sacramento and the San Francisco Bay Area to Los Angeles and San Diego). The No-Project Alternative satisfies the statutory requirements under California Environmental Quality Act (CEQA) and National Environmental Protection Act (NEPA) for an alternative that does not include any new action or project beyond that already committed.

The No-Project Alternative defines the existing and future state-wide intercity transportation system based on programmed and funded (already funded programs/financially constrained plans) improvements to the intercity transportation system through 2020, according to the following sources of information:

- State Transportation Improvement Program (STIP)
- Regional Transportation Plans (RTPs) for all modes of travel
- Airport plans
- Intercity passenger rail plans (California Rail Plan 2001-2010, Amtrak Five- and Twenty-year Plans)

Recent history and the uncertainties of transportation financing in California point to a reality that many of the improvements identified in those plans may not be implemented by 2020. That notwithstanding, the No-Project Alternative is the best projection that can be made for year 2020 conditions based on current local and regional planning policy.

As with all of the alternatives, the No-Project Alternative will be assessed against the purpose and need topics/objectives for congestion, safety, air pollution, reliability, and travel times.

1.1.2 Modal Alternative

There are currently only three main options for intercity travel between the major urban areas of San Diego, Los Angeles, the Central Valley, Sacramento and the Bay Area cities of San Jose, Oakland and San Francisco. They are vehicles on the interstate highway system, state highways, commercial airlines, and conventional passenger trains (Amtrak) on freight and/or commuter rail tracks. The Modal Alternative consists of expanding highways, airports, and intercity and commuter rail systems serving the markets identified for the HST Alternative. (**FIGURES 2** and **3**) The Modal Alternative uses the same intercity travel demand assumed under the high-end sensitivity analysis completed for high-speed train ridership in 2020. It also assumes that capacity will be added to the No-Project Alternative to meet this added demand. Therefore, the Modal Alternative includes the highways, airports, and passenger rail described under the No-Project Alternative, and the additional improvements or expansion of facilities to meet the demand, regardless of funding potential and without high-speed train service as a part of the system.

Figure 1 No-Project Alternative - California Transportation System

Figure 2 Modal Alternative – Highway Component

Figure 3 Modal Alternative – Aviation Component

The Modal Alternative adds capacity in discrete amounts to roadways and airports throughout the state. With the implementation of such an alternative, the traveling public is likely to respond to this new capacity by making use of the improved facilities for all trips and not just intercity trips. Where capacity is added, traffic congestion will be eased, making a particular roadway a more attractive route for both intercity traffic and shorter trips within a region. An analogous situation at airports would be where transcontinental or international flights make use of the capacity that was added to meet the intercity demand. In the case of both roadways and airports, the forecasted intercity demand will compete for capacity with non-intercity traffic in the air and on the road. As phenomenon cannot be evaluated quantitatively at the scale of this analysis, the assessment of the Modal Alternative is likely to provide an optimistic picture of the consequences of adding capacity to roadways and airports in terms of congestion and level of service.

1.1.3 High-Speed Train Alternative

The Authority has defined a state-wide high-speed train system capable of speeds in excess of 200 miles per hour (mph) on dedicated, fully grade-separated tracks, with advanced safety, signaling, and automated train control systems. The state-of-the-art HST system would serve the major metropolitan centers of California, extending through the Central Valley from Sacramento and the San Francisco Bay Area to Los Angeles and San Diego. (**FIGURE 4**)

As considered in this document, the HST Alternative includes several corridor and station options. Within the Sacramento-Bakersfield corridor, all high-speed train operations would be on exclusive guideways.

For purposes of comparative analysis, the HST corridors are described from station-to-station within each region, except where a by-pass option is considered when the point of departure from the corridor defines the end of the corridor segment. The Sacramento to Bakersfield region has been divided into six corridors: Corridor A runs generally from Sacramento to Stockton; Corridor B, from Stockton to Modesto; Corridor C, from Modesto to Merced; Corridor D, from Merced to Fresno; Corridor E, from Fresno to Tulare; and Corridor F, from Tulare to Bakersfield. Within any given corridor, various alignment options have been developed. Each alignment option is named with an alpha-numeric designation: the letter corresponds to the corridor, and the number refers to a specific route within that corridor. The corridors and alignment routes for HST for this region are defined and presented in Appendix A.

As intercity trips are diverted to the proposed HST system, the highway and aviation facilities will initially become less congested. The traveling public is likely to respond to this newly available capacity by making use of the facilities for all trips and not just intercity trips, similar to the situation described for the additional capacity in the Modal Alternative. Although, this phenomenon cannot be evaluated quantitatively at the scale of this analysis, the assessment of the HST Alternative is likely to give an optimistic picture of the consequences of relieving congestion on roadways and airports in terms of level of service.

Figure 4 High-Speed Train Alternative – Corridors and Stations for Continued Investigation

2.0 BASELINE/AFFECTED ENVIRONMENT

2.1 STUDY AREA

The Sacramento-Bakersfield corridor and its major transportation facilities are shown on **FIGURE 5**. This section discusses key intercity highway corridor screenlines, the vicinity of each station location, and airports under consideration for expansion in the Modal Alternative.

2.1.1 Intercity Highways

Baseline (2002) traffic conditions were analyzed at key locations along intercity highways in the Sacramento/Bakersfield corridor (i.e., I-5, SR 99, and I-80 west of Sacramento). These locations are shown on **FIGURES E-1, E-2** and **E-3** in Appendix E.

The basis for selecting intercity analysis points (or "screenlines") was projections of future traffic congestion. Freeway links forecasted to experience the heaviest daily traffic (i.e., highest traffic volume per lane) were identified using RTP models for the various jurisdictions in the HST corridor. The rationale for choosing the most heavily utilized links as screenlines was to allow a comparative analysis of the impact of the project alternatives at the most congested future points on the intercity highway system. Forecast volumes and the planned number of lanes were obtained directly from RTP models for the regions within the Corridor.

Typically two screenlines were analyzed for each intercity freeway segment. As intercity highway segments cross county and regional planning boundaries, one screenline was identified in each county. Intercity links were further defined as being: 1) at the edge of an urbanized area (in most cases, at least 5 miles from the downtown area of the central city), 2) locations where traffic count and capacity data was available, and 3) subject to highest level of projected 2020 congestion along the corridor.

2.1.2 Rail Stations

Seven station locations are proposed for the HST segment between Sacramento and Bakersfield, with a total of 14 specific candidate stations:

- Sacramento – two candidate station locations
- Stockton – one off-line candidate station location
- Modesto – two candidate station locations
- Merced – three candidate station locations
- Fresno – one candidate station location
- Hanford or Visalia – one candidate station location in each city; high-speed trains would not serve both cities
- Bakersfield – three candidate station locations

Candidate station locations are shown on **Figure 5**. Key characteristics of the candidate station locations are as follows.

Figure 5 High-Speed Train Sacramento-to-Bakersfield Corridor

Sacramento

Two locations are under consideration for the Sacramento area: the Sacramento Intermodal Amtrak Station and Power Inn Road. The Sacramento Intermodal Amtrak Station is located at the existing Amtrak station at I and 7th Streets in downtown Sacramento. This area is near Old Town Sacramento, government offices, the capitol, major downtown shopping areas, and the Sacramento light rail. There are two station options for the Power Inn Road station depending on the alignment. The station could be located on either Power Inn Road or 21st Street, in an area bounded by Power Inn Road, Florin Perkins Road, Fruitridge Road, and 14th Avenue.

Stockton

The Stockton area station under consideration is located at the downtown Altamont Commuter Express (ACE) Station, on the Union Pacific Railroad between Aurora Street, Union Street, Channel Street, and Weber Avenue. The site is centrally located a few blocks from the downtown area, with major activity centers within walking distance. The Stockton station would be an off-line station, requiring the acquisition of additional rail right-of-way.

Modesto

Two station options are under consideration in Modesto: a downtown station, and a suburban station. The downtown station would be directly west of the Central Business District (CBD), bounded by 9th, 8th, I, and K Streets, adjacent to the downtown bus terminal, and commercial/retail uses. The suburban station would be located adjacent to the existing Amtrak station at the intersection of East Briggsmore Avenue/Santa Fe Avenue, approximately 5 miles northeast of downtown Modesto, adjacent to residential areas, and about 1 mile from commercial/retail centers.

Merced

Three station options are being considered in the Merced area: downtown, Castle Air Force Base (AFB), and the Merced Municipal Airport. The downtown station location is bordered by Main, M, 15th and V Streets at the City and County transit center, and Greyhound Bus terminal. The site is located about ¼-mile from the downtown area, 6 miles from the proposed UC Merced Campus, and 3 miles from the Merced Municipal Airport.

Another station option is the former Castle AFB with access from Perimeter Avenue. The AFB is located approximately 8 miles from downtown Merced, and approximately 10 miles from the proposed UC Merced Campus. Merced County has been designated as the local base reuse authority and is currently requesting qualifications for a master site developer. Proposed uses include research and development, educational facilities, and high tech/industrial uses.

A station east of Thornton Road at the Merced Municipal Airport is also being considered. The airport is located approximately 3 miles south of downtown Merced, and 9 miles from the proposed UC Merced Campus.

Fresno

The Fresno station would be located on G Street and Fresno Street, approximately one block northwest of the Greyhound Bus terminal. The station area is located at the western end of the business district, with many parcels surrounding the station area currently used for parking. Only one Fresno station is under consideration and all proposed alignments would be consolidated at this location.

Hanford/Visalia

The Hanford station would be located between Fifth and Sixth Streets, a few blocks from the downtown area, adjacent to an existing Amtrak station. Downtown Hanford consists of office and retail establishments, but is not considered a major activity center in the region.

The site under consideration in Visalia is located at the SR 99 and SR 198 junction, adjacent to the Visalia Airport. This site is 6 miles from downtown Visalia, and 2 miles from the community of Goshen. Major activity centers surrounding the site include an airport, city park, Holiday Inn with conference center, and a golf course. The remaining land uses are devoted to agricultural activities.

Either the Hanford or Visalia station would be constructed, however, not both.

Bakersfield

Three station locations are under consideration for the Bakersfield area: the airport area, on Golden State Highway, and Truxtun (downtown). The airport station would be located at the junction of SR 99 and SR 65 northwest of the Meadow Field Kern County Airport, approximately 8 miles northwest of downtown. The Golden State station would be located north of the Golden State Highway (SR 204) and west of Chester Avenue, next to the Metro Recreation Center. The downtown station has two alternatives depending on the alignment of the rail lines. With either alignment, the station would be located between Truxtun Avenue and California Avenue, west of SR 204. The downtown station would be within walking distance of an existing Amtrak station, Convention Center, CBD, and commercial/retail areas.

2.1.3 Airports

Six airports are considered in the Modal Alternative:

- Sacramento International Airport (SMF)
- Modesto City-County Airport (MOD)
- Merced Municipal Airport (MCE)
- Fresno Yosemite International Airport (FYI)
- Visalia Municipal Airport (VIS)
- Bakersfield Meadows Field Kern County Airport (BFL)

The airport locations are shown on **Figure 5**. The Stockton Airport was not considered in the impacts analysis due to constraints that make airport expansion infeasible.

SMF is located 12 miles northwest of downtown Sacramento and is the largest airport in the Central Valley serving the state-wide and national passenger market. A total of 12 airlines currently serve SMF with over 150 flights per day, annually serving 8 million passengers (2001).

MOD is located east of downtown Modesto and south of East Briggsmore Avenue on Airport Way. Four daily round-trip flights are provided to San Francisco International Airport. This airport provides the only commercial airline service in Stanislaus County.

MCE is located south of the downtown area and provides the only commercial air and freight cargo service in Merced County. The runway at MCE is of sufficient length to allow turbo jet aircraft to take-off/ land. Daily flights to Las Vegas International Airport are currently provided by Scenic Airlines.

FYI is located approximately 5 miles north of downtown Fresno. Twelve major airlines serve FYI with daily flights to 17 cities and Mexico. An air cargo park with over 500,000 square feet of cargo building space is currently under construction.

VIS is located approximately 6 miles west of downtown Visalia and currently offers daily non-stop flights to San Francisco and Los Angeles.

BFL is located approximately 7 miles north of downtown Bakersfield, on Seventh Standard Road at SR 99. Daily non-stop flights are offered to Los Angeles, San Francisco, and Phoenix.

2.2 General Description of Transportation Facilities Comprising the Screenlines and Cordons Used for Impact Analysis

2.2.1 Intercity Highways

TABLE 1 identifies one or more specific traffic analysis locations (screenlines) for each intercity segment of I-5, SR 99, and I-80. The longer intercity segments were identified by Kaku Associates of the HST Program Management Team. As noted above, specific links forecasted to experience congestion in the 2020 or 2025 timeframe based on their respective RTPs were selected as screenlines.

TABLE 1
Screenline Locations by Highway Facility and Intercity Segment

FACILITY	Segment From:	To:	Specific Screenline(s)	Lanes in each direction
I-80	I-5	Sacramento	Yolo Causeway	3
I-5	I-80	Stockton	Between Hood Franklin Rd & Elk Grove Blvd	2
			North of J11 to Sacramento/San Joaquin Co. line	2
	Stockton	I-580/SR 120	North of 1-205 & 1-5 jct.	4
	I-580/SR 120	SR 152	South of I-580	2
	SR 152	SR 99	Between Whitworth Rd & SR 33	2
			Between SR 165 & Merced/Fresno Co. line	2
			Between SR 33 & SR 145	2
			Between Buttonwillow Rowlee & Lerdo Hwy	2
			Between SR 166 & SR 99	2
SR 99	Sacramento	SR 120	Between Mack Rd & Florin Rd	3
			Between Collier Rd & Liberty Rd	2
	SR 120	Modesto	Between Ripon Rd & San Joaquin/Stanislaus Co. line	3
			Between Hammett Rd & San Joaquin/Stanislaus Co. line	3
	Modesto	Merced	South of Mitchell Rd	3
			Between Bloss & Robin (west of Livingston)	2
	Merced	SR 152	Sandy Mush Rd. to Merced/Madera Co. line	2
	SR 152	Fresno	Herndon Ave to Madera/Fresno Co. line	2
	Fresno	Tulare/Visalia	Between Adams Ave & Clovis Ave	3
			Between Ave 384 & Tulare/Fresno Co. line	2
	Tulare/Visalia	SR 58	North of 7th Standard Rd	3
	I-5	SR 58	Between SR 119 & Houghton Rd	3

2.2.2 Station Area Conditions

This section describes the roadway system surrounding each station area. Study roadways are those crossing a circular cordon line drawn around each station, at ¼- to ½-mile radii for stations in downtown locations, and about 1 mile radii at suburban locations. The smaller radii for downtown stations accounts for a roadway network comprised of closely spaced streets and intersections, while the large cordon radii for the suburban locations accounts for the greater distance between intersections and roadway faculties.

Sacramento

The following describes the roadway facilities at the two Sacramento area stations under consideration.

Downtown

A cordon line of about ¼-mile was drawn around the downtown Sacramento station, encompassing 16 roadway segments (several one-way). All roadways that would provide access to the station area were accounted for including: I-5/SR 99, C, G, H, I, J, and L Streets, and 3rd, 5th, 7th, 8th, 9th, and 10th Streets, as shown on **FIGURE A-1** in Appendix A.

I-5/SR 99 is located to the west of the station area and is the major north-south roadway through the Central Valley to Southern California. In the study area, five lanes per direction are provided. Access to the station from I-5/SR 99 would be provided by an interchange on I Street. Other freeway facilities in the area include I-80, Business 80, and US 50. These highways are major east-west corridors linking the San Francisco Bay Area with Reno, Nevada, and other destinations.

A grid network of one- and two-way streets, that typically offers three travel lanes, provides local access in the station area. The major one-way/east-west streets in the area include I, L, and J Streets; secondary one-way/east-west access is provided by G and H Streets. Major one-way/north-south facilities in the study area include 5th and 7th Streets, with secondary north-south access provided by 3rd, 8th, 9th, and 10th Streets.

Power Inn Road

A cordon line of an approximate 1 mile radius was drawn around the Power Inn Road station. This cordon line encompasses seven roadway segments that would provide primary access to the station area including Power Inn Road, Florin Perkins Road, Fruitridge Road, and 14th Avenue, as shown on **FIGURE A-2** in Appendix A.

Primary access to the Power Inn Road station area would be provided by Power Inn Road, a north-south, four-lane major arterial located west of the station area. Land uses abutting Power Inn Road are primarily industrial and commercial with high volumes of truck traffic. Intersections along Power Inn Road are generally signalized. Florin Perkins Road is a north-south, two- to four-lane arterial with traffic controlled by signalization and is located east of the station area which extends from Kiefer Boulevard to Florin Road in South Sacramento. Land uses fronting this facility are generally industrial.

Fruitridge Road is an east-west, four-lane major arterial to the south of the station area with a freeway interchange at SR 99. Land uses on this facility are generally residential and commercial. Located to the north of the station area, 14th Avenue is an east-west, four-lane arterial that extends from Florin Perkins Road to an interchange at SR 99. Residential and commercial uses front this roadway.

Stockton

The downtown Stockton HST station is being considered for integration into the Altamont Commuter Express (ACE) Station, located south of Minor Avenue and west of Sacramento Street. A cordon line of approximately ½-mile was drawn around the Stockton station and encompasses the roadway segments (several one-way) that provide primary access to the station area including Airport Way and Wilson Way, El Dorado and Center Streets, SR 4, Oak and Park Streets, and Stanislaus and California Streets, as shown on **FIGURE A-3** in Appendix A.

SR 4 is located four blocks south of the station site with local interchanges at Stanislaus Street and Wilson Way. SR 4 connects SR 99 and I-5 and provides six travel lanes in the study area. El Dorado and Center Streets are four-lane designated north-south arterials in the study area, and together form a one-way couplet. These facilities are located west of the station area. Wilson Way and Airport Avenue are also designated four-lane, north-south major arterials east of the station area. Minor Avenue is a designated east-west major arterial located to the north of the project site and provides two travel lanes. California Street is a designated north-south minor arterial with four travel lanes. The remaining roadways in the study area are designated collector facilities.

Modesto

The following describes the roadway facilities providing access to the two Modesto station locations under consideration.

Downtown

A cordon line of approximately ¼-mile was drawn around the Modesto downtown station location. This cordon line encompasses 15 roadway segments (several one-way) that would provide primary access to the station area including 7th, 9th, 10th, 11th, and 12th Streets, and J, K, and L Streets, as shown on **FIGURE A-4** in Appendix A.

Regional access to downtown Modesto is provided by SR 99, SR 132, and SR 108. These facilities are located in close proximity to the station area. SR 99 is the regional north-south connector in the Central Valley. SR 108 connects Modesto with Riverbank and Oakdale, while SR 132 runs from the Sierra Nevada foothills in the east and connects to I-5 and I-580 in the west.

The roadway network in the downtown area is comprised of a grid system with one-way roadway segments. Major east-west arterials in the downtown study area include L Street (SR 132 and SR 108) and K Street (SR 108). These two streets form a one-way couplet with three lanes provided on each facility. The major north-south arterial is 9th Street (SR 132) which provides four travel lanes. Other roadway facilities that provide access to the station area include north-south 7th, 10th, 11th and 12th Streets, and east-west oriented J Street. J Street has four travel lanes, while the other north-south facilities provide two travel lanes.

Briggsmore

A cordon line of approximately 1 mile was drawn around the suburban station. This cordon line encompasses six roadway segments that would provide primary access to the station area including Claus Road, East Briggsmore Avenue, and Parker Road, as shown on **FIGURE A-5** in Appendix A.

Claus Road is a north-south expressway facility located west of the station area. Two to four lanes are currently provided on Claus Road in the designated study area, but it widens to a four- to six-lane arterial street west of the cordon point. This facility extends from SR 132 to Riverbank and County Route J7.

East Briggsmore Avenue is an east-west facility that interchanges with SR 99. Two travel lanes are currently provided on East Briggsmore Avenue in the study area. This street is renamed Parker Road east of the station area.

Merced

The following describes the roadway facilities that provide access to the three Merced station locations under consideration. The Merced street system is formed around a 1 mile grid of north-south roadways, including Highway 59, R, and G Streets, and Parson Avenue. Regional access to the area is provided by SR 99.

Municipal Airport

A cordon line of approximately 1 mile was drawn around the MCE station location. This cordon line encompasses the roadway segments that would provide access to the station area, including: West Avenue, Childs Avenue, Thornton Road, and Dickenson Road, as shown on **FIGURE A-6** in Appendix A.

The area surrounding the airport is comprised mainly of two-lane roadways. Dickenson Road and Childs Avenue are east-west oriented roadways, while West Avenue and Thornton Road are north-south oriented roadways.

Castle AFB

A cordon line of approximately 1 mile was drawn around the Merced Castle AFB station location. This cordon line encompasses six roadway segments that would provide primary access to the station area including: Shaffer Road, Santa Fe Drive, and Walnut Avenue, as shown on **FIGURE A-7** in Appendix A.

Shaffer Road is a two-lane, north-south arterial located west of the station area. This roadway connects Atwater to Winton. Santa Fe Drive (J7) is a diagonally-oriented, northwest-southeast arterial that connects Merced to Modesto. Four lanes are provided on this roadway in the study area. Walnut Avenue is a minor two-lane, east-west street located north of the project site.

Downtown

A cordon line of about ¼-mile was drawn around the Merced downtown station location. This cordon line encompasses nine roadway segments that would provide access to the station area including R and M Streets, 16th Street, Martin Luther King Jr. Way, and SR 99/SR 56/SR 140, as shown on **FIGURE A-8** in Appendix A.

Major arterials in the downtown area include R and M Streets, and Martin Luther King Jr. Way, which are north-south oriented roadways that provide four travel lanes. An interchange with SR 99/SR 56/SR 140 is provided at R Street and Martin Luther King Jr. Way. East-west arterials in the study area include 16th Street, which also provides four travel lanes.

Fresno

The streets in Fresno are oriented in a north-south/east-west grid system shifting to a diagonal orientation south of Divisadero Street in the downtown area. Within this diagonal grid system, the Fresno station is proposed at the intersection of H and Fresno Streets. Major state routes such as SR 99, SR 180, and SR 41 are accessible from the station area, and the western end of Fresno's CBD is located four blocks north of the station.

An approximately ¼-mile cordon line around the downtown Fresno station location encompasses roadway segments (several one way) that provide access to the station area including SR 99, E, G, and H Streets, Fresno, Tuolumne, Stanislaus, Tulare, and Broadway Streets, as shown on **FIGURE A-9** in Appendix A.

Four-lane, east-west roadways that would serve the station area include Fresno and Tulare Streets. Four-lane north-south roadways that would serve the site include Broadway, G, E, and H Streets. Other roadways in the study area include Stanislaus and Tuolumne Streets, which operate as a one-way couplet to the north of the station. Van Ness Avenue, east of the station area, is a two-lane, north-south facility which provides access to the study area.

Hanford

A cordon line of approximately 1 mile was drawn around the downtown Hanford station. This cordon line encompasses roadways that would provide access to the station area including 10th and 11th Avenues, Douty Street, East Lacey Boulevard, and SR 198, as shown on **FIGURE A-10** in Appendix A.

The City of Hanford has classified 10th and 11th Avenues and Lacey Boulevard as arterials in the study area. 11th Avenue provides four travel lanes, while 10th Avenue provides two travel lanes. The number of lanes on Lacey Boulevard varies between two and four. Douty Street is a two-lane collector located east of the station area. SR 198 is located south of the site area, with four travel lanes and interchanges at 10th and 11th Avenues and Redington Street.

Visalia

A cordon line of approximately 1 mile was drawn around the Visalia station location. This cordon line encompasses roadways that would provide access to the station area including SR 99, SR 198, and Plaza Drive, as shown on **FIGURE A-11** in Appendix A.

SR 198 is an east-west corridor connecting Fresno and Tulare Counties. Four lanes are provided on SR 198 in the study area. SR 99 is located west of the station area with four travel lanes. An interchange is provided between SR 198 and SR 99. Plaza Drive is a north-south arterial, east of the station site. The facility connects VIS and the City of Dinuba to the north. Access to SR 198 from Plaza Drive is provided via an interchange.

Bakersfield

The following describes the roadway facilities providing access to the three Bakersfield station locations under consideration. The Bakersfield freeway system is comprised of SR 99, which serves the Central Valley, and SR 58, an east-west facility connecting SR 99 to I-5. Other freeways in metropolitan Bakersfield include a portion of SR 204 from SR 99 to SR 58, and a portion of SR 178 between M Street and Fairfax Road.

Airport

The BFL is located adjacent to SR 99 and SR 65. A cordon line of approximately 1 mile encompasses the seven roadway segments that would provide access to the station area, including SR 99, SR 65, and Seventh Standard, Norris and Coffee Roads, as shown on **FIGURE A-12** in Appendix A.

Seventh Standard Road is an east-west, two-lane arterial with an interchange to SR 99. This roadway is located north of the project site. Coffee Road is a north-south arterial that currently provides two travel lanes and intersects with Seventh Standard Road west of the project site. SR 65 is a two-lane facility which connects Bakersfield with Porterville.

Golden State

A cordon line of approximately ¼-mile was drawn around the Bakersfield Golden State station location. This cordon line encompasses six roadway segments that would provide access to the station area including Chester Avenue, West Columbus, 34th Street, and SR 204, as shown on **FIGURE A-13** in Appendix A.

Chester Avenue is a north-south roadway with four travel lanes and is a designated arterial east of the station area that connects the BFL to the downtown area. West Columbus and 34th Street are both designated east-west collectors, located east of the station area. SR 204 is located west of the station area and provides six travel lanes in the study area.

Truxtun

A cordon line of about ¼-mile was drawn around the Bakersfield Truxtun station location. This cordon line encompasses Union, California, and Truxtun Avenues, as shown on **FIGURE A-14** in Appendix A. The Truxtun station is located in downtown Bakersfield, and is bounded by two east-west arterial roadways (Truxtun and California Avenues). California Avenue provides six travel lanes throughout the study area, while Truxtun Avenue has six travel lanes west of Union Street, and four travel lanes east of Union Avenue. Union Avenue (SR 204) is a north-south oriented arterial with six travel lanes.

2.2.3 Airport Areas

Sacramento International Airport (SMF)

SMF is located off I-5 at the Airport Boulevard interchange, as shown on **FIGURE A-15** in Appendix A. North Bayou Road, which fronts I-5, connects with Airport Boulevard from both the east and west. No other roadways provide access to SMF. Currently, Airport Boulevard provides four travel lanes in and out of the terminal area.

Modesto City-County Airport (MOD)

MOD is located on Airport Way and can be accessed by a number of roadways, as shown on **FIGURE A-16** in Appendix A. From the north, MOD is accessible via Yosemite Boulevard (SR 132) and El Vista Avenue. Access roadways to the south of the terminal include Hatch Road. Interchange with SR 99 is provided at both Yosemite Boulevard and Hatch Road. Local access to the airport is provided on Airport Way via Mitchell Road. Mitchell Road connects Hatch Road and Yosemite Boulevard and intersects with Airport Way. Mitchell Road currently has four travel lanes in the vicinity of MOD.

Merced Municipal Airport (MCE)

MCE is located on Macready Drive, with access from Grogran Avenue. The airport is located approximately 5 miles south of I-5, as shown on **FIGURE A-17** in Appendix A. Other roadways providing access to MCE include V Street, West Avenue, Childs Avenue, and Thornton Road.

Fresno Yosemite International Airport (FYI)

FYI is located between the cities of Fresno and Clovis on Clinton Avenue, as shown on **FIGURE A-18** in Appendix A. Regional access to FYI is provided by SR 180 and SR 168 via interchanges at Chestnut Avenue and McKinley Avenue, respectively. SR 180 also interchanges with SR 41 and SR 99. Chestnut, McKinley, North Clovis, and Peach Avenues provide local access to Clinton Avenue. Clinton Avenue currently provides between four and six travel lanes to the terminal area.

Visalia Municipal Airport (VIS)

VIS is located southeast of the SR 99/SR 198 interchange, as shown on **FIGURE A-19** in Appendix A. Local access is provided from Airport Drive via Plaza Drive.

Bakersfield Meadows Field Kern County Airport (BFL)

The ***BFL*** terminal is located off Airport Drive on Skyway Drive, as shown on **FIGURE A-20** in Appendix A. Airport Drive is a north-south arterial with an interchange at SR 99/SR 204. Access from the northwestern portion of Bakersfield is provided via an interchange on SR 99 at Seventh Standard Road. Airport Drive currently provides four travel lanes, while Seventh Standard Road is a two-lane facility, scheduled to be upgraded to a freeway configuration (SR 58).

The Stockton Metropolitan Airport was not included in this analysis due to constraints that limit the feasibility of its expansion.

2.2.4 Existing Station Area Transit

This section describes the local bus, light rail transit, and para-transit service currently available at each potential HST station during all or part of the planned high-speed train daily operating period.

Sacramento

The Sacramento Regional Transit District (SACRT) operates bus routes and light rail in the vicinity of the potential downtown and suburban HST stations. Buses operate daily from 5:00 AM to 11:30 PM every 15 to 60 minutes, depending on the route. Light rail trains operate from 4:30 AM to 1:00 AM with service every 15 minutes during the day and every 30 minutes in the evening.

Downtown

The downtown Sacramento station is located within the existing Amtrak station, which is serviced by four Amtrak routes:

- *California Zephyr* route connects Chicago, Illinois with San Francisco, California, with a daily direct train service provided to/from Sacramento.
- *Capital Corridor* route connects Auburn, California to San Jose, California, with six round trips per weekday.
- *Coast Starlight* route connects Seattle, Washington to Los Angeles, California, with one daily round trip train.
- *San Joaquin* route provides service from both Sacramento and Oakland to Bakersfield, with six round trips daily. Connecting bus service from Bakersfield to the Los Angeles area is also provided as a part of the San Joaquin Amtrak route.

The downtown Sacramento HST station also lies within several blocks of the transit hub for SACRT. Currently, SACRT has 29 routes servicing the station area with a total of 49 buses in the AM peak hour. SACRT also operates light rail in the station area, with several downtown stops and four trains in the AM peak hour. The closest light rail station to the proposed HST station is approximately five blocks to the southeast of the HST station area. The Yolobus system also operates at the Sacramento Intermodal Amtrak Station with nine routes providing 14 AM peak hour trips.

Power Inn Road

The SACRT currently has two routes that serve the station area with a total of four buses in the AM peak hour. SACRT also operates light rail near the HST station, with four trains operating through the Power Inn light rail station (about 1 mile from the HST station) in the AM peak hour. The light rail is linked by a shuttle route that operates in a clockwise direction on Folsom Boulevard, Florin Perkins Road, Fruitridge Road, and Power Inn Road, with two buses in the AM peak hour.

Stockton

The proposed HST station in Stockton is located at the existing Amtrak/ACE station that is served by Amtrak's San Joaquin route, connecting Sacramento and Oakland to Bakersfield. One Amtrak train serves the downtown Amtrak/ACE station daily, with the remainder of the Stockton Amtrak service provided from the San Joaquin Street Station located approximately 1 mile southwest of the Amtrak/ACE station.

The major downtown transfer point for the Stockton Metropolitan Area Fixed Route Service (SMART), a part of the San Joaquin Regional Transit District (SJRTD), is at Channel and Sutter Streets, five blocks west of the station site. SMART provides seven bus routes, with approximately 30 buses serving the area during the AM peak hour, with headways ranging from 40 to 60 minutes. Buses generally run seven days a week with service from 6:00 AM until 6:30 and 9:30 PM, depending on the route. Four intercity bus routes also serve the downtown area with 8 buses in the AM peak hour.

Modesto

Modesto is served by the Modesto Area Express (MAX) bus system. MAX service hours are from 6:15 AM to 7:30 PM, Monday through Friday; 8:15 AM to 7:00 PM, Saturdays; and 8:45 AM to 6:00 PM on Sundays.

Downtown

The downtown station site is located two blocks northwest of the MAX Center, the transfer point for 16 bus routes providing 26 buses in the AM peak hour. Bus frequencies are between 30 and 60 minutes, Monday through Saturday, and hourly on Sunday. The Center is also the hub for service provided by the Stanislaus Regional Transit (START) to outlying communities. START has four routes with four buses in the AM peak hour. These routes have 60 to 90 minute frequencies between 5:15 AM and 9:00 PM, Monday through Friday; Saturday service runs from 6:20 AM to 7:55 PM.

Briggsmore

Two MAX routes serve this location providing three buses in the AM peak hour with a frequency of service between 30 and 60 minutes. An Amtrak station is located adjacent to the proposed HST station. Amtrak's San Joaquin route, connecting Sacramento and Oakland to Bakersfield, serves the Modesto Station, with six daily round trips from both Oakland and Sacramento (two trains in the AM peak hour, and five daily round trips from Bakersfield including one train in the AM peak hour).

Merced

Merced County Transit's "The Bus" system operates locally and beyond, with connections out of the Merced Transpo Center to Turlock, Atwater, Livingston, Los Banos, and Dos Palos. Service hours are 7:00 AM to 6:30 PM, Monday through Friday, and 9:00 AM to 5:00 PM on Saturdays.

Airport

Three routes serve the general area with four buses in the AM peak hour. One bus provides service to MCE, although not to the proposed station location. Route frequencies range from 30 to 90 minutes.

Castle AFB

Three weekday routes serve the general area with a total of four buses in the AM peak hour. Frequencies range between 1 to 2 hours.

Downtown

The downtown station site is located adjacent to the Merced Transpo Center transfer station. Ten of the 16 system routes serve the transit station with 13 buses in the AM peak hour. Frequencies range from 30 minutes to more than 2 hours. The Yosemite Area Regional Transportation System (YARTS) has one route with one bus in the AM peak hour. Merced's Amtrak station is located approximately ¾-mile from the downtown HST station. This station is served by Amtrak's San Joaquins route, connecting Sacramento and Oakland to Bakersfield. Six daily round trips are provided from both Oakland and Sacramento with two trains in the AM peak hour and five daily round trips from Bakersfield (including one train in the AM peak hour).

Fresno

The proposed station is in close proximity to the downtown Transit Mall used by the Fresno Area Express (FAX) bus system, which provides 18 fixed-route lines. Operating hours are 5:10 AM to 11:00 PM weekdays, and 6:15 AM to 7:30 PM on the weekends. Eight routes serve the downtown Transit Mall, with 17 buses in the AM peak hour. Amtrak's Fresno Station is located approximately 1 mile to the southwest of the proposed station and is served by the San Joaquin route. Six daily round trips from Sacramento, (including one train in the AM peak hour), five daily round trips from Oakland (including one train in the AM peak hour), and five daily round trips from Bakersfield (with one train in the AM peak hour) are provided to Fresno.

Hanford

The proposed station area is near the Amtrak Station, which also serves as the hub for the Kings Area Rural Transit (KART). Amtrak's San Joaquin route serves Hanford, with five daily trains to Bakersfield (including one in the AM peak hour), five daily trains to Oakland (with one in the AM peak hour), and six daily trains to Sacramento (including one in the AM peak hour). KART service in the area is provided by five bus routes, which run every 30 minutes. A total of 10 buses are provided in the AM peak hour. Operating hours are 6:30 AM to 6:30 PM weekdays, and 9:30 AM to 5:00 PM on Saturday. KART also provides regional service to outlying communities with varying hours and frequencies. Three routes provide this service with four buses in the AM peak hour

Visalia

VIS is adjacent to the proposed station and is served by two routes of the Visalia City Coach with two buses in the AM peak hour. Operating hours are from 7:00 AM to 7:00 PM, Monday through Friday, and 10:00 AM to 6:00 PM on Saturdays.

Bakersfield

Bakersfield is served by the Golden Empire Transit District (GET). Operating hours are Monday through Friday, 6:30 AM to 10:45 PM, and 6:30 AM to 7:15 PM on Saturday and Sunday. Bus frequencies range from 20 to 60 minutes.

Airport

One bus line serves the BFL area, although no transit service is currently provided to the proposed HST station area.

Golden State

Three bus routes provide service to the station site area, with a total of seven buses in the AM peak hour.

Truxtun

The Truxtun station site is served directly by three bus routes providing 18 AM peak hour buses. The Truxtun site is located slightly over 1 mile from the downtown transit center, where 10 bus routes converge bringing the total number of buses serving the general area during the AM peak hour to 41.

The Bakersfield Amtrak Station is located less than ½-mile from the proposed HST station. Connecting bus service is provided to the Los Angeles area, with six inbound and six outbound buses per day (with one outbound bus during the AM peak hour). Five daily round trips are provided to Oakland and six daily round trips are provided to Sacramento, each with one outbound train during the AM peak hour.

Taxi and Rental Car Services

Taxi service is available at all proposed station sites to destinations throughout their respective cities. Rental car services are also available within each city, but not at potential HST station sites. Most rental car companies offer pick-up service.

2.2.5 Airport Public Transportation Services

SMF is not served by the SACRT. However, the Yolobus (Yolo County bus system) has one route that serves the airport with one bus during the AM peak hour. In addition to Yolobus service, many shuttle services and taxicab companies operate at SMF, in addition to nine rental car companies.

MOD is served by MAX. Currently, one MAX route serves MOD on an "on-call" basis. Area hotels also offer shuttles to MOD and taxicabs are available. There are also three rental car companies located at the airport.

MCE is served by the local Merced transit system "The Bus". One route serves MCE with two buses in the AM peak hour. Taxicab service is available to MCE, and rental cars are available in downtown Merced.

FYI is served by FAX, with one route servicing the airport in the AM peak hour. Shuttle and taxicab services are also available, in addition to five rental car companies.

VIS is served by two routes of the Visalia City Coach with two buses in the AM peak hour. Taxicab service is available at the airport, with rental car availability in downtown Visalia.

BFL is served by one GET route with one AM peak hour bus. Shuttle and taxicab services are also available, in addition to five rental car companies.

2.2.6 Intercity Public Transportation Services

Amtrak and Greyhound provide intercity transit within the Sacramento-Bakersfield corridor, as well as to other regional destinations such as Los Angeles or San Francisco. Other transit providers offer intercity travel between valley cities or various commute destinations (such as Stockton to the San Francisco Bay Area). Information in this section is derived from public transit agency web-sites listed in the Bibliography.

Amtrak

The Amtrak San Joaquin rail route runs the length of the San Joaquin Valley with Bakersfield as the southern terminus. There are six round trips daily (as of October 27, 2002); five trips continue west of Stockton, and terminate in Oakland, and the sixth round trip continues north of Stockton and terminates in Sacramento. Connecting bus service is provided to Los Angeles from Bakersfield. Amtrak also has connecting bus service to Sacramento, Yosemite, Tahoe, Reno, Barstow, Paso Robles, San Jose, and Redding.

Three additional Amtrak routes serve the Sacramento area: California Zephyr, Capitol Corridor, and Coast Starlight. The California Zephyr connects Chicago, Illinois with San Francisco, California, with daily direct train service provided to/from Sacramento. The Capitol Corridor route connects Auburn, California to San Jose, California, with six round trips per weekday. The Coast Starlight route connects Seattle, Washington to Los Angeles, California, with one daily round trip train.

Greyhound

Greyhound Bus Lines serves all the main cities of the San Joaquin Valley. Frequent connections can be made to various areas throughout the state and/or country.

Altamont Commuter Express (ACE)

This commuter rail service connects the San Joaquin Valley to the Bay Area with three round trips daily.

The Capitol Corridor

The Capitol Corridor rail service links Sacramento at the proposed Downtown Station (Amtrak Depot) and the Bay Area with 11 round trips daily.

Orange Belt Stages

Orange Belt Stages provides intercity bus service between the southern San Joaquin Valley, Las Vegas, Barstow, and Paso Robles. Orange Belt Stages coordinates services with local providers, Greyhound, and Amtrak.

Commuter Services

Connecting commuter bus service is available via SMART-SJRTD (Stockton) to various destinations within the Bay Area. MAX provides similar bus service for Modesto-Bay Area commuters.

2.3 BASELINE RATIOS OF DEMAND TO CAPACITY ACROSS SCREENLINES OR CORDONS

2.3.1 Intercity Screenlines: 2002 Traffic Conditions

Volumes for 2002 were obtained from the Caltrans web-site. Percentages for the AM peak hour/peak direction traffic for the study links were obtained from Caltrans data. For links where this information was unavailable, the AM peak hour/peak direction traffic was conservatively estimated as 6 percent of daily traffic (10 percent in the peak hour with a 60/40 directional split).

Traffic volumes were adjusted for the percentage of trucks, as indicated by Caltrans' Truck Volumes data for 2001. Consistent with the *2000 HCM*, a passenger car equivalent (pce) of 1.5 for trucks was assumed. The V/C analysis assumes a basic capacity of 2,300 pce per lane for I-5 and I-80, and 2,000 pce for SR 99. The capacity for I-5 is based on the *2000 HCM* for a freeway with a design speed of 65 mph or higher. The capacity assumption for SR 99 reflects an intermediate value between capacity data provided by the *2000 HCM* for a full freeway and expressway.

The analysis presented in **TABLE 2** indicates that two intercity highway segments (I-80 west of downtown Sacramento and SR 99 between Mack and Florin Roads in Sacramento) are operating at above-capacity conditions (i.e., LOS F). Two additional segments operate at LOS E (I-5 between Franklin Road and Elk Grove Boulevard in Sacramento, and SR 99 between Ripon Road and the San Joaquin/Stanislaus County line). The remaining intercity screenlines currently operate at acceptable levels (V/C ratios less than 0.91).

2.3.2 Station Area Analysis

Traffic data used for the analysis of the HST station areas was collected from a variety of sources including RTPs, General Plan circulation elements, and regional travel models. Traffic data sources for each station area are summarized in **TABLE 3**. The average annual growth rate for roadway segments within each cordon is also shown on this table. These annual growth rates were determined by linear interpolation between the base and future year traffic volumes provided by each data source. Rates in this analysis were used to estimate 2002 volumes in cases where source documents reported other recent years, and to extrapolate 2002 volume estimates of the 2020 No-Project conditions.

Using the information listed in each of the sources and the annual growth factors from Table 2, year 2002 volumes for each of the station cordons were determined and summarized, as shown in **TABLE 4**. Detailed information relating to each location is discussed below, and detailed tabular data is provided in Appendix C. All station-area cordons currently operate at V/C ratios less than 1.00. **FIGURE 6** summarizes the cordon information for each station area.

TABLE 2
Existing (2002) Screenline Analysis
AM Peak Hour

Highway	Specific Screenline Link	# Lanes per direction	V/C	LOS
I-80	Yolo Causeway	3	1.19	F
I-5	Between Hood Franklin Rd & Elk Grove Blvd	2	0.93	E
	North of J11 to Sacramento/San Joaquin Co. line	2	0.74	C
	North of 1-205 & 1-5 jct.	4	0.74	C
	South of I-580	2	0.59	A
	Between Whitworth Rd & SR 33	2	0.40	A
	Between SR 165 & Merced/Fresno Co. line	2	0.40	A
	Between SR 33 & SR 145	2	0.44	A
	Between Buttonwillow Rowlee & Lerdo Hwy	2	0.43	A
	Between SR 166 & SR 99	2	0.42	A
SR 99	Between Mack Rd & Florin Rd	3	1.19	F
	Between Collier Rd & Liberty Rd	2	0.65	B
	Between Ripon Rd & San Joaquin/Stanislaus Co. line	3	0.96	E
	Between Hammett Rd & San Joaquin/Stanislaus Co. line	3	0.82	D
	South of Mitchell Rd	3	0.68	B
	Between Bloss & Robin (west of Livingston)	2	0.45	A
	Sandy Mush Rd. to Merced/Madera Co. line	2	0.38	A
	Herndon Ave to Madera/Fresno Co. line	2	0.64	B
	Between Adams Ave & Clovis Ave	3	0.66	B
	Between Ave 384 & Tulare/Fresno Co. line	2	0.62	B
	North of 7th Standard Rd	3	0.50	A
	Between SR 119 & Houghton Rd	3	0.35	A

TABLE 3
Traffic Data Source Summary and Annual Station Area Traffic Growth Rates

Station Location	Traffic Volume and Facility Capacity Data Source	Avg Annual Station Area Growth Rate
Sacramento-Downtown	2000 SacMet (Sacramento Metropolitan Area Council of Governments) Model	2 %
Sacramento-Power Inn	2000 SacMet Model	2 %
Stockton-Downtown	1999 SJCOG (San Joaquin County Council of Governments) Model	2 %
Modesto-Briggsmore	2000 STANCOG (Stanislaus County Council of Governments) Model	6 %
Modesto-Downtown	2000 STANCOG Model	2 %
Merced-Castle AFB	2000 MCAG (Merced County Association of Governments) Model	2 %
Merced-Airport	2000 MCAG Model	4 %
Merced-Downtown	2000 MCAG Model	< 1 %
Fresno-Downtown	1998 Fresno COG (Fresno County Council of Governments) Model	3 %
Hanford-Downtown	2001 Kings County Regional Transportation Plan, Appendix I-A and I- E	2 %
Visalia	2001 City of Visalia Circulation Element.	7 %
Bakersfield-Golden State	2000 Bakersfield General Plan	6 %
Bakersfield-Truxtun	2000 Bakersfield General Plan	3 %
Bakersfield-Airport	2000 Bakersfield General Plan	4 %

TABLE 4
Station Cordon Summary
Existing (2002) Conditions – AM Peak Hour

Station Location	ADT	Peak Hour Traffic	Capacity	Volume/ Capacity	Level of Service
Sacramento-Downtown	461,539	46,154	72,200	0.61	B
Sacramento-Power Inn	171,164	17,116	20,800	0.79	C
Stockton-Downtown	352,389	35,238	73,300	0.46	A
Modesto-Briggsmore	70,318	7,032	12,700	0.50	A
Modesto-Downtown	124,079	12,409	25,000	0.48	A
Merced-Castle AFB	60,692	6,069	14,800	0.40	A
Merced-Airport	12,532	1,253	5,500	0.21	A
Merced-Downtown	294,463	29,446	34,000	0.85	D
Fresno-Downtown	260,760	26,077	68,200	0.35	A
Hanford-Downtown	125,047	13,965	30,400	0.41	A
Visalia	139,245	13,924	32,200	0.38	A
Bakersfield-Golden State	131,909	13,191	23,680	0.56	A
Bakersfield-Truxtun	137,642	13,765	34,000	0.40	A
Bakersfield-Airport	179,651	17,965	31,160	0.58	A

Figure 6 Station Area Level of Service: Existing 2002

Sacramento

Downtown

The cordon analysis of the downtown Sacramento station area shows that the roadways surrounding the proposed station area operate at LOS B during the AM peak hour. Additionally, the analysis indicates that no roadway segments currently operate at over-capacity conditions (i.e., LOS F) during the AM peak hour.

Power Inn Road

The roadways providing access to the Power Inn station area generally operate at LOS C. However, the analysis indicates that two roadway segments, Power Inn Road and Florin Perkins, currently operate at over-capacity conditions (i.e., LOS F) during the AM peak hour. Additionally, 14th Avenue operates at LOS E conditions.

Stockton

The roadways surrounding the downtown Stockton station area operate at an overall service level of LOS A. However, the cordon analysis indicates that Minor Avenue, east of Wilson Way, operates at over-capacity conditions (i.e., LOS F) during the AM peak hour. Additionally, Fremont Street, east of Wilson Way, operates close to capacity (i.e., LOS E).

Modesto

Downtown

Traffic conditions within a ¼-mile area surrounding the downtown Modesto station operate at an overall service level of LOS A. Additionally, no roadway segments currently operate at over-capacity conditions (i.e., LOS F) during the AM peak hour.

Briggsmore

Roadways within the 1 mile cordon around the East Briggsmore Avenue station area operate at an overall service level of LOS A. Additionally, no roadway segments providing access to the station area currently operate at over-capacity conditions (i.e., LOS F) during the AM peak hour.

Merced

Municipal Airport

The roadway segments surrounding the MCE area currently operate at a service level of LOS A during the AM peak hour. Additionally, no roadway segments providing access to the station area currently operate at over-capacity conditions (i.e., LOS F) during the AM peak hour.

Castle AFB

The roadways surrounding Castle AFB currently operate with an excess capacity during the AM peak hour with an overall service level of LOS A. No roadway segments within the cordon operate at over-capacity conditions (i.e., LOS F) during the AM peak hour.

Downtown

The cordon level roadway analysis indicates LOS D operations during the AM peak hour. M Street, south of 18th Street, currently operates at over-capacity conditions (i.e., LOS F) during the AM peak hour. Segments of R Street and Martin Luther King Jr. Way operate close to capacity (i.e., LOS E).

Fresno

The cordon analysis indicates overall LOS A conditions on the roadways that would provide access to the station area. Additionally, no roadway segments providing access to the station area currently operate at over-capacity conditions (i.e., LOS F) during the AM peak hour.

Hanford

The roadways providing access to the proposed Hanford station area generally operate at LOS A; however, 10th Street to the south of Grangeville Boulevard, currently operates at over-capacity conditions (i.e., LOS F) during the AM peak hour.

Visalia

On a cordon level, the roadways that would serve the Visalia station area operate at LOS A during the AM peak hour. Additionally, no roadway segments providing access to the station area currently operate at over-capacity conditions (i.e., LOS F) during the AM peak hour.

Bakersfield

Airport

Overall, the roadways that would provide access to the BFL station location operate at LOS A during the AM peak hour. Additionally, no roadway segments providing access to the station area currently operate at over-capacity conditions (i.e., LOS F) during the AM peak hour.

Golden State

The roadways surrounding the station area currently operate at a cordon level of LOS A. While no individual segments operate at over-capacity conditions (i.e., LOS F) during the AM peak hour, SR 204 northwest of Chester Street, currently operates at close to capacity conditions (i.e., LOS E).

Truxtun

The cordon level analysis indicates the roadways in the study area operate at LOS A. Additionally, no roadway segments providing access to the station area currently operate at over-capacity conditions (i.e., LOS F) during the AM peak hour.

2.3.3 Airport Cordons

Traffic data for the airport area analysis was collected from RTPs, General Plan circulation elements, and regional travel models. Traffic data sources for each airport area are summarized in **TABLE 5**. The average annual growth rate for roadway segments within each cordon is also shown on this table. These annual growth rates were determined by linear interpolation between the base and future year traffic volumes provided by each data source.

TABLE 5
Traffic Data Source Summary and Annual Airport-Area Traffic Growth Rates

Station Location	Traffic Volume Data Source	Average Annual Airport Area Growth Rate
Sacramento (SMF)	2000 SacMet Model	2 %
Modesto (MOD)	2000 STANCOG Model	1 %
Merced (MCE)	2000 MCAG Model	9 %
Fresno (FYI)	1998 Fresno COG Model	5 %
Visalia (VIS)	2001 City of Visalia Circulation Element.	7 %
Bakersfield (BFL)	2000 Bakersfield General Plan	12 %

TABLE 6 and **FIGURE 7** summarize the existing (2002) access analysis for each airport considered under the Modal Alternative. Detailed tabular data is provided in Appendix D.

TABLE 6
Airport Access Summary
Existing (2002) Conditions – AM Peak Hour

Airport Location	ADT	Peak Hour Traffic	Capacity	Volume/ Capacity	Level of Service
Sacramento (SMF)	23,897	2,389	3,600	0.66	B
Modesto (MOD)	56,016	5,601	7,200	0.76	C
Merced (MCE)	2,551	255	2,000	0.11	A
Fresno (FYI)	12,448	1,244	6,000	0.17	A
Visalia (VIS)	67,774	6,778	16,500	0.36	A
Bakersfield (BFL)	26,767	2,677	8,000	0.33	A

Currently, the airport access roadways operate at an acceptable level of service during the AM peak hour, with no airport roadways operating at over-capacity (i.e., LOS F) or close to over-capacity (i.e. LOS E) conditions during the AM peak hour. All airport area cordons currently operate at V/C ratios less than 1.00.

Figure 7 Airport Area Level of Service: Existing 2002

2.4 BASELINE CONDITIONS FOR GOODS MOVEMENT (TRUCK/FREIGHT) IN THE STUDY AREA

Current highway bottlenecks affecting goods movement were identified based on the San Joaquin Valley Goods Movement Study (SJVGMS) and the Sacramento RTP section on freight issues. Based on these documents, current truck routes with significant congestion include the following:

- I-5 and SR 99 through Sacramento
- I-5 and SR 99 through Stockton
- SR 99 at SR 120 in San Joaquin County
- The major interregional corridors serving distribution routes to the Bay Area
  - I-80
  - I-205 to I-580
  - SR 132 to I-580
  - SR 120 to I-205
- SR 120 at Valley Home Road in Stanislaus County
- SR 99 at SR 132 in Modesto
- SR 152 at SR 165 in Merced County
- SR 99 at Gateway Drive in Madera County
- SR 99 through Fresno and north to the Fresno-Madera County line
- SR 65 from Bakersfield through Porterville
- Portion of SR 58 from Bakersfield to SR 14

These current freight bottlenecks are shown on **FIGURE 8**. Analysis was performed on most of these links as part of the SJVGMS. This analysis utilized 1997 traffic data and Florida Department of Transportation (FDOT) Level of Service Methodology (a generalized method based on average daily traffic rates). The LOS results indicated that most of these links are at or approaching capacity (LOS F) at peak times using a conservative assumption regarding the effect of trucks. The SJVGMS assumes a pce of 2.0 for all trucks, a higher value than the 1.5 pce recommended by the *2000 HCM*.

The SJVGM study notes that congestion at these locations is likely to get worse, given continued traffic growth and other trends.

> *As congestion increases, peak periods spread, and the length of interregional truck trips increases, it may become increasingly difficult to promote off-peak truck movements.* (SJVGMS, p. 7-2)

As such, peak hours for goods movement will increasingly coincide with peak hours for all traffic.

Figure 8 – Goods Movement Bottlenecks

2.5 BASELINE CONDITIONS FOR PARKING IN THE VICINITY OF STATIONS AND AIRPORTS

2.5.1 Station Area Parking

The following sections discuss the current parking supply in the vicinity of each station area.

Sacramento

As of February 2000, a total of 18,300 parking spaces were provided in downtown Sacramento, of which approximately 8,000 are public with the remaining 10,300 held privately. A parking space shortfall of between 2,000 and 4,000 spaces was identified in the *2005 Downtown Sacramento Redevelopment Strategy* (February 2000). The deficiency in downtown parking is attributed to state and federal office buildings constructed without sufficient parking.

Although parking shortages are forecasted for the area, there are currently five public parking areas in downtown Sacramento within one block of the proposed HST station. Numerous other parking garages are also located in the downtown area. The city also offers prepaid and metered parking and operates its own parking facilities. Additional parking in the vicinity of the station area is also proposed in conjunction with the Sacramento Intermodal Station Area Plan.

The Power Inn Road Station is located in an area with limited public parking supplies.

Stockton

As of 1990, a total of 1,537 public off-street parking spaces were provided in Stockton's CBD. Some lots provide ½-hour of free parking (with validation), while other lots are reserved for monthly permit holders. In addition to public parking, numerous private garages are operated in the downtown areas.

The *Downtown Stockton Strategic Plan* identifies parking as a major issue impacting future development of the downtown area. Short- and long-term parking goals have been established in the Plan for implementation by the City Manager's Office, Public Works Department, and the Housing and Redevelopment Office. Additionally, two new public parking structures are proposed on Weber Avenue at American Street, approximately four blocks from the proposed station area.

Modesto

Parking lots bound the downtown Modesto station area, with lots on 8th, 9th, K and I Streets. A 700-space garage was recently constructed on 10th Street. A 700-space parking garage at the corner of 12th and I Streets was identified in the *Stanislaus County Capital Improvement Plan* as a funded and approved project that is currently in the planning phase.

The area surrounding the East Briggsmore Avenue site is generally undeveloped, and public parking supplies are limited to those provided at the Amtrak station (i.e., approximately 150 parking spaces).

Merced

Merced's downtown parking district provides approximately 1,400 public parking spaces. The areas surrounding the Castle AFB station and MCE area are currently undeveloped, with limited off-street parking supplies.

Fresno

The city of Fresno has metered parking, as well as private and city-owned parking lots and garages. In the vicinity of the downtown Fresno site, parking is available two blocks from the proposed station on Kern Street and adjacent to the station on Fresno Street. During peak hours, a park-and-ride shuttle operates between designated city lots and downtown locations.

Hanford

Policies to *"provide adequate parking and loading facilities while encouraging alternative means of transportation"* are presented in Hanford's *General Plan Update 2002*. The General Plan also identifies policies to encourage transit and carpooling by establishing park-and-ride lots near highly traveled commute routes and encouraging the development of shared parking facilities.

Visalia

The area surrounding the proposed HST station is generally undeveloped, except for the airport, where approximately 120 parking spaces are provided. The City of Visalia developed a *Downtown Visalia Parking Management Plan* in 1990 to identify existing and future parking supply and demand. This Plan identified parking management strategies such time limits, enforcement, additional parking supplies, parking permits, and parking development standards. No parking management plans are available for the station area.

Bakersfield

Parking strategies for the downtown Bakersfield area have been identified through the *Vision 2020* process, as documented in the *Downtown Design Charrette* (May 11-17, 2001). These strategies include the establishment of a parking authority, consolidation of structured parking, and ordinances and other elements to improve the parking supply in the downtown Bakersfield area.

2.5.2 Airports

SMF has over 12,000 public parking spaces in five parking lots. A 4,300 space parking structure is currently under construction with anticipated completion for 2004. A parking fee is charged.

MOD currently has 224 parking spaces, including 175 long-term, 12 short-term, 17-rental car, and 20 employee spaces. This level of parking demand is sufficient to meet current demands, according to airport staff.

MCE has approximately 60 parking spaces which can be used at no charge.

FYI offers both long- and short-term parking. The number of spaces provided at the airport is not available.

VIS provides free parking. Based on information provided by airport parking staff, the airport currently has approximately 120 parking spaces, and levels of occupancy are low.

BFL has on-site long- and short-term parking available for a fee. Based on information provided by airport parking staff, approximately 300 parking spaces are available.

3.0 EVALUATION METHODOLOGY

The traffic, transit, circulation, and parking analyses for this program-level EIR/EIS were focused on a broad comparison of potential impacts to traffic, transit, circulation, and parking along stations and around corridors for each alternative (Modal and High-Speed Train). The potential impacts for each of these alternatives were compared with the No-Project Alternative.

Highway, roadways, passenger transportation services (i.e., bus, rail, air, intermodal, and transit facilities), goods movements, and parking issue were evaluated in the analyses. Transportation facilities, highways, and roadways included in the analyses: 1) serve as the primary means of existing (or planned future) access to proposed rail stations and airports; 2) are within 1 mile of the proposed suburban rail stations, ¼-mile of proposed downtown stations, or within 1 mile of airports; or 3) are key capacity-constraint points on major routes along intercity corridors.

Initial analysis included identifying primary routes to be considered, with highways designated in the No-Project and Modal Alternatives and all modes of access to the stations and airport areas in the Modal and HST Alternatives, respectively. The primary routes/modes of access for the stations and airports considered assumptions for distribution of trips by direction.

Once primary routes were identified, screenlines or cordons combining segments of the primary routes which reasonably represent locations for evaluating the aggregate baseline traffic and public passenger transportation conditions (using data for 2002, 2020, or other similar years as available) in the AM peak hour were selected. The use of screenlines or cordons is necessitated by the scale of this analysis with its requirement to evaluate roadway conditions throughout the state. A more detailed analytical framework must necessarily be reserved for future analyses of individual projects.

Screenlines, especially on intercity highway links, have been selected to represent typical AM peak hour conditions. The data used in the evaluation of traffic volumes and capacities at the screenlines therefore are typical values based on averages over time and represented in traffic forecasting tools used by the regional transportation planning agencies. As such, the conditions indicated in the evaluation may not always reflect the experiences of travelers at any particular place at any specific time. For example, localized capacity restrictions (e.g., bottlenecks at a given interchange) are not well-represented in those regional traffic models. In addition, incidents on the road such as accidents and vehicle breakdowns (non-recurring congestion) are not represented in regional traffic models. This unpredictable type of incident is responsible for the majority of congestion in urban highway networks. The result of these limitations of the methodology and data used in this analysis is that many times the level of service shown in the evaluation may be more optimistic than what would actually be experienced on the roadway under the forecasted conditions. Thus, it is important to consider the differences between the alternatives compared versus focusing on the absolute value of the indicators (i.e., V/C or LOS).

Baseline conditions were defined using the following methodology:

- *For Intercity Screenlines* – Baseline conditions (2002, 2020) were established for intercity highway segments based on available counts of existing weekday AM peak hour traffic volumes and projected annual growth rates. This involved a comparison of existing V/C to determine level of service at link level.

- *For Station and Airport Cordons* – Baseline (2002 and 2020 data, as available) ratios of demand to capacity across each cordon for roadways (not intersections) were established for the weekday AM peak hour using *2000 HCM* standards for capacity.

- *For Transit Access* – Baseline conditions were established through an inventory of available public transportation services at and adjacent to the stations and airports.

- *For Goods Movement* – Baseline conditions (2002, 2020) for goods movement (truck freight) weekday AM peak hour for locations in the area were identified as critical by regional goods movement studies.

- *For Parking in the Vicinity of Stations and Airports* – Descriptions of parking conditions are based on 2002 parking reserves, local plans for major parking expansion, and adequacy of local parking codes for meeting No-Project growth in demand.

Trip generation was then calculated by adding to baseline volumes the forecasted 2020 demand for high-speed rail and (for the Modal alternative) airports, or highways comprising alternatives, plus local trips in 2020 generated by project-related development (as data are available). Additional trips were distributed to the identified screenlines or cordons (roadway and public transportation) and added those trips to the appropriate baseline volumes for each screenline or cordon. Next, additional trips were distributed for selected segments/links on primary regional routes and modes of access to stations and similar facilities by adding No-Project volumes obtained from 2020 forecasts (from regional and local agencies), and 2020 travel demand generated by alternatives, to the key accessing facilities (roadways, transit links). This distribution was done at a screenline level to reduce the subjectivity of assigning trips to specific facilities. This involved the following methodology:

- For each screenline or cordon, new ratios or demand-to-capacity were calculated. Demand is the baseline volumes plus additional trip generation by the Modal or HST Alternatives.

- Future No-Project link capacity conditions were established through available plans from local and regional agencies, and based on the Tier 1 (fiscally constrained) element of the relevant RTP.

- For the Modal Alternative, assumed 2020 capacity is the baseline capacity plus any improvements included in the Tier 2 (fiscally unconstrained) element of the RTP needed to mitigate potential V/C impacts. In some instances, further roadway widenings (i.e., beyond even the Tier 2 RTP projects) were needed to provide capacity sufficient to meet projected traffic.

- Link-level analysis of impacts was performed to roadways for weekday AM peak hour conditions. Capacity levels were based on the *2000 HCM* methodologies.

- Future roadway V/C on selected segments compared future volumes with/without alternatives with future capacity determined. Future V/C with/without the alternatives were analyzed. This assessment was performed at a cordon level, aggregating the V/C on all major facilities accessing the stations or airports.

- Cordon-level analysis was also performed for public transportation services serving the stations or airports, based on weekday AM peak hour service headway and capacity conditions.

- Impacts were determined by comparing future load factors or service headway requirements with existing levels, No-Project levels (as specified in relevant RTPs), and levels demanded by the Modal and HST Alternatives.

- Goods movement impacts were determined through an assessment of the net impact of project alternatives on the corridor.

Summary tables for the region were then completed that identified impacts on highways/roadways (at screenline), public transportation services, goods movement, and parking facilities. The impacts are

described and ranked as "high", "medium" or "low" in the summary table according to the potential extent of change to traffic, transit, circulation, and parking and described in terms of LOS A to LOS F for traffic impacts.

The final step included the identification of mitigation strategies for avoidance of potential impacts related to traffic, circulation, and parking. Most mitigation measures involve subsequent analysis of traffic, circulation, or parking in the next phase of work.

4.0 TRAFFIC, TRANSIT, CIRCULATION, AND PARKING IMPACTS

4.1 NO-PROJECT ALTERNATIVE

4.1.1 Future 2020 Intercity Highway Analysis

Volumes for 2020 were extrapolated from the 2002 base traffic using growth factors derived from RTP travel model forecasts. Morning peak hour and peak direction traffic volumes were estimated to represent the same percentage of daily traffic as in the 2002 existing scenario. The 2020 peak hour directional split of traffic was assumed to be consistent with the current directional split; where such data are lacking, 60 percent of traffic is assumed to be in the peak direction.

The percentage of trucks was also assumed to be the same as in the existing (2002) scenario (i.e., growth in truck traffic will parallel the growth in traffic overall). Truck pce per-lane capacity values were also retained for the analysis of 2020 traffic conditions.

The number of lanes at each screenline in the year 2020 reflects improvements called for in the current RTPs for the Corridor under fiscally constrained conditions (i.e. improvements for which public funding is reasonably foreseeable by the year 2025).

TABLE 7 lists specific screenline facilities by location and 2020 No-Project V/C ratios. Even with planned improvements for 2025 in place, eight freeway segments are projected to operate at LOS F (up from two under 2002 conditions). One additional segment is projected to operate at LOS E (near-capacity), while the remaining 13 intercity screenlines currently operate at low levels of LOS D or better (V/C ratios of under 0.90).

The full V/C analysis, including 2002 and projected 2020 traffic volumes and truck percentages, is provided in Appendix E. **Figures E-4, E-5** and **E-6** map the results of the 2020 No-Project intercity screenline traffic analysis in comparison to existing 2002 conditions.

It should be noted that the intercity screenlines were selected as these are the locations at which the effects of the HST and Modal Alternatives are most significant. While these represent the most congested intercity locations, portions of I-5 and SR 99 within the major cities in the corridor will also experience over-capacity conditions in 2020 and beyond, even with planned roadway improvements.

4.1.2 Future 2020 Station Area Conditions

The data sources summarized in **TABLE 3** were used to determine future traffic conditions around the station areas. Additionally, information provided in the RTPs for each region were used to identify planned roadway improvements in the vicinity of each station that has a reasonable expectation of construction prior to the opening year of the high-speed train service. The following discusses roadway improvements around each station area.

TABLE 7
Existing (2002) and No-Project (2020) Intercity Screenlines
AM Peak Hour

		Existing (2002)			No-Project (2020)		
Highway	Screenline Link	Lanes	V/C	LOS	Lanes	V/C	LOS
I-80	Yolo Causeway	3	1.19	F	4	1.15	F
I-5	Between Hood Franklin Rd & Elk Grove Blvd	2	0.93	E	2	1.53	F
	North of J11 to Sacramento/San Joaquin Co. line	2	0.74	C	2	1.30	F
	North of 1-205 & 1-5 jct.	4	0.74	C	5	0.87	D
	South of I-580	2	0.59	A	2	0.96	E
	Between Whitworth Rd & SR 33	2	0.40	A	2	0.67	B
	Between SR 165 & Merced/Fresno Co. line	2	0.40	A	2	0.61	B
	Between SR 33 & SR 145	2	0.44	A	2	0.66	B
	Between Buttonwillow Rowlee & Lerdo Hwy	2	0.43	A	2	0.78	C
	Between SR 166 & SR 99	2	0.42	A	2	0.67	B
SR 99	Between Mack Rd & Florin Rd	3	1.19	F	3	1.51	F
	Between Collier Rd & Liberty Rd	2	0.65	B	2	1.01	F
	Between Ripon Rd & San Joaquin/Stanislaus Co. line	3	0.96	E	3	1.40	F
	Between Hammett Rd & San Joaquin/Stanislaus Co. line	3	0.82	D	3	1.57	F
	South of Mitchell Rd	3	0.68	B	3	0.84	D
	Between Bloss & Robin (west of Livingston)	2	0.45	A	3	0.39	A
	Sandy Mush Rd. to Merced/Madera Co. line	2	0.38	A	2	0.56	A
	Herndon Ave to Madera/Fresno Co. line	2	0.64	B	3	0.69	B
	Between Adams Ave & Clovis Ave	3	0.66	B	3	1.03	F
	Between Ave 384 & Tulare/Fresno Co. line	2	0.62	B	3	0.61	B
	North of 7th Standard Rd	3	0.50	A	3	0.74	C
	Between SR 119 & Houghton Rd	3	0.35	A	3	0.73	C

Note: Lanes per direction.

4.1.2.1 Roadway Improvements

Sacramento

Downtown

No roadway improvements were assumed in the vicinity of the proposed rail station for purposes of the cordon analysis, although the City of Sacramento is undertaking a major planning effort to revaluate and redesign the rail yard area. This planning effort could change land uses and general circulation in the area. However, as plans have not been approved, the ultimate extent of changes to the downtown area is unknown at this time.

Power Inn Road

Based on information provided in the Sacramento Metropolitan Area model, improvements to Power Inn Road and Florin Perkins Road are planned. Both roads would be widened from four to six lanes in the vicinity of the station area.

Stockton

No improvements to the roadway system surrounding the downtown Stockton location were identified in the RTP.

Modesto

Downtown

No improvements to the roadway system surrounding the downtown Modesto location were identified in the RTP.

Briggsmore

Information provided in the Stanislaus County RTP indicates that Claus Road (north of East Briggsmore Road) will be widened from two to six lanes. Additionally, the widening of East Briggsmore Road (west of Claus Road) from two to six lanes is also proposed.

Merced

No improvements to any roadway facilities surrounding the three proposed Merced station locations were identified in the RTP.

Fresno

No improvements to any of the downtown Fresno roadway facilities were identified in the RTP.

Hanford

No improvements to any of the downtown Hanford roadway facilities were identified in the RTP.

Visalia

Improvements to the roadways surrounding the Visalia station are detailed in the *2001 Visalia Circulation Element*. Improvements assumed to be in place by 2020 include widening SR 99 from four to six lanes and widening Plaza Drive (north of SR 198) from two to four lanes.

Bakersfield

Airport

In the vicinity of the airport station, the widening of Seventh Standard Road from two to six lanes is proposed in the vicinity of Airport Drive. West of Coffee Drive, Seventh Standard Road would be widened from two to four lanes. Additionally, the widening of Coffee Road from two to six lanes is also assumed by 2020 (as detailed in the *2000 City of Bakersfield General Plan*).

Golden State

Improvements in the vicinity of the Golden State station include capacity improvements to SR 204. No improvements to surface streets in the station area are identified in the RTP.

Truxtun

No improvements to the roadways in the cordon analysis for the Truxtun station were assumed, although a new cross-town freeway is proposed in the area (as detailed in the *2000 City of Bakersfield General Plan*). This facility would connect SR 99 to SR 204 and SR 178 on an alignment between California and Truxtun Avenues.

4.1.2.2 Cordon Analysis

Roadway improvements as described above were incorporated into the analysis of future conditions at each station area, as shown in **TABLE 8.** The data sources presented in **TABLE 3** were utilized to determine future traffic volumes in the areas surrounding each station. Overall, the roadways surrounding the Sacramento to Bakersfield station areas, as described by aggregate cordon analysis, will operate at or below capacity (i.e., LOS E or better). However, some individual roadway segments will operate at over-capacity conditions (i.e., LOS F). Appendix C contains detailed analysis worksheets for each of the station areas.

A comparison to the existing (2002) condition, also presented in TABLE 7, shows that traffic conditions will worsen around all the proposed station areas. For example, conditions around the downtown Sacramento station are projected to worsen from an existing LOS B to LOS D by 2020. The Future 2020 station area cordon analysis is also summarized in **FIGURE 9**.

TABLE 8
Existing (2002) and No-Project (2020) Station Area Analysis
AM Peak Hour

	Existing (2002)					No-Project (2020)				
Station Location	**ADT**	**Peak Hour Traffic**	**Capacity**	**Volume/ Capacity**	**Level of Service**	**ADT**	**Peak Hour Traffic**	**Capacity**	**V/C**	**LOS**
Sacramento-Downtown	461,539	46,154	72,200	0.61	B	623,512	62,340	72,200	0.86	D
Sacramento-Power Inn	171,164	17,116	20,800	0.79	C	231,729	23,160	29,200	0.79	C
Stockton-Downtown	352,389	35,238	73,300	0.46	A	450,449	45,040	73,300	0.61	B
Modesto-Briggsmore	70,318	7,032	12,700	0.50	A	136,614	13,660	21,300	0.64	B
Modesto-Downtown	124,079	12,409	25,000	0.48	A	163,432	16,340	25,000	0.65	B
Merced-Castle AFB	60,692	6,069	14,800	0.40	A	78,079	7,808	14,800	0.53	A
Merced-Airport	12,532	1,253	5,500	0.21	A	20,101	2,010	5,500	0.37	A
Merced-Downtown	294,463	29,446	34,000	0.85	D	328,478	32,848	34,000	0.97	E
Fresno-Downtown	260,760	26,077	68,200	0.35	A	370,554	37,055	68,200	0.54	A
Hanford-Downtown	125,047	13,965	30,400	0.41	A	169,240	19,199	30,400	0.63	B
Visalia	139,245	13,924	32,200	0.38	A	296,245	29,630	46,400	0.64	B
Bakersfield-Golden State	131,909	13,191	23,680	0.56	A	258,299	25,830	28,140	0.92	E
Bakersfield-Truxtun	137,642	13,765	34,000	0.40	A	226,045	22,610	34,000	0.67	B
Bakersfield-Airport	179,651	17,965	31,160	0.58	A	340,792	34,070	40,660	0.84	D

Figure 9 Station Area Level of Service: Existing 2002 vs. Baseline 2020

Sacramento

Downtown

The cordon around the Sacramento downtown station is projected to operate at an overall LOS D in 2020, worsening from an existing LOS B. However, several roadways at the downtown Sacramento station are projected to operate at over-capacity conditions (i.e., LOS F), including SR 99, I-5, and C Street west of SR 99/I-5. Several other roadways are projected to operate close to capacity (i.e., LOS E) during the AM peak hour. These roadways include J Street to the east of 10th Street, and 9th Street to the south of L Street. All other roadway segments providing access to the station area are projected to operate at LOS D or better during the AM peak hour.

Power Inn Road

The roadway system surrounding the Power Inn Road station is projected to operate at an overall service level of LOS C, the same as in the existing condition. However, two roadway segments (14th Avenue to the east of the 65th Expressway and Power Inn Road to the south of Folsom Boulevard) are projected to operate at over-capacity conditions. South of Fruitridge Road, conditions on Power Inn Road improve to LOS E.

Stockton

The cordon around the Stockton station is projected to operate at an overall service level of LOS B. Several roadway segments in the downtown Stockton area are projected to operate at deficient levels of service including Airport Way, Fremont Street, Minor Avenue, and SR 4. Although these segments operate at LOS F conditions during the AM peak hour, the majority of other streets in the area are projected to operate at LOS A conditions.

Modesto

Downtown

The cordon around the downtown Modesto station is projected to operate at an overall level of service of LOS B. However, in the downtown Modesto area, 7th Street is projected to operate at an over-capacity service level during the AM peak hour. Additionally, 11th Street is projected to operate close to capacity (i.e., LOS E) during the AM peak hour. All other roadway segments providing access to the station area are projected to operate at LOS D or better.

Briggsmore

One roadway (Church Street to the south of Parker Avenue) is projected to operate at a deficient level of service near the suburban Modesto station. One additional roadway segment (Claus Road to the south of East Briggsmore Road) is projected to operate at LOS E.

Merced

Municipal Airport

All study roadways within the vicinity of MCE are projected to operate at LOS C or better, with most roadways operating at LOS A.

Castle AFB

All study roadways within the vicinity of the Castle AFB are projected to operate at LOS D or better, with most roadways operating at LOS A.

Downtown

Overall, the downtown area is very congested with several roadway segments operating at LOS F and overall conditions of LOS E along the cordon line. Conditions are projected to worsen from the existing LOS D around the station area. Roadways projected to operate at LOS F conditions include R, M, and 16th Streets. SR 99/SR 59/SR 140 are projected to operate at LOS D during the AM peak hour.

Fresno

All study roadways within the vicinity of the Fresno downtown station are projected to operate at LOS D or better, with roadways operating at an overall service level of LOS A. Although most roadways are projected to operate at acceptable levels of service with the addition of high-speed train traffic, four east-west roadways are proposed to be closed at the rail right-of-way (Divisadero, Kern and Mono Streets, and East Florence Avenue). These roads provide local access across the tracks, and do not provide a regional east-west connection over the rail lines.

Hanford

By 2020, all roadways are projected to operate within capacity during the AM peak hour, except for 10th Avenue, south of Grangeville Road.

Visalia

Roadways surrounding the Visalia station are proposed to operate at an overall service level of LOS B, with no individual roadway segment operating below LOS C.

Bakersfield

Airport

Roadway facilities around the BFL station are projected to operate at an overall service level of LOS D; however, portions of SR 65, Seventh Standard Road, Norris Road, and SR 99 are projected to operate at LOS E or LOS F. Conditions are projected to worsen from the existing LOS A operations.

Golden State

Segments of SR 204 are projected to operate at a level of service of LOS F during the AM peak hour. Surface streets in the vicinity of the station are projected to operate at LOS C or better. Overall, traffic conditions on the cordon are projected to worsen from LOS A (2002) to LOS E (2020).

Truxtun

Overall, the roadways surrounding the Truxtun station area are projected to operate at a level of service of LOS B. However, Union Avenue, south of California Avenue, is projected to operate at LOS E during the AM peak hour.

4.1.3 Future 2020 Airport Area Conditions

The data sources as summarized in **TABLE 5** were used to determine future traffic conditions around each airport area. Additionally, information provided in the RTPs for each region were used to identify planned roadway improvements in the vicinity of each airport that has a reasonable expectation of construction prior to the opening year of the high-speed train service. The following discusses roadway improvements around each airport area and the 2020 cordon analysis results.

4.1.3.1 Roadway Improvements

Roadway capacity improvements are planned around VIS including improvements to Plaza Drive and Shirk Road, which provide access to the airport area. No other access improvements were assumed at any other airport location.

4.1.3.2 Access Analysis

The results of the No-Project Alternative are summarized in **TABLE 9** and presented on **FIGURE 10**. Access roadways to BFL are projected to operate at LOS F conditions by 2020. The widening of Airport Drive to provide six travel lanes would improve the level of service to an acceptable range. Additionally, the access roadway to the MOD is projected to operate at LOS E. Access roadways to the remaining airports are projected to operate at LOS D or better by 2020.

Based on this study's "high", "medium", and "low" standards of traffic impact, all but one airport access roadway will operate at "low" levels (V/C ratios less than 1.00). One will operate at "medium" impact (V/C ratios between 1.0 and 1.5), and none operate at "high" impact (V/C over 1.5). Traffic conditions are projected to worsen around four of the airport locations, with conditions around BFL deteriorating from LOS A in 2002 to LOS F in 2020.

TABLE 9
Existing (2002) and No-Project (2020) Airport Area Analysis
AM Peak Hour

	Existing (2002)					No-Project (2020)				
Airport	ADT	Peak Hour Traffic	Capacity	V/C	LOS	ADT	Peak Hour Traffic	Capacity	V/C	LOS
Sacramento (SMF)	23,897	2,389	3,600	0.66	B	31,772	3,180	3,600	0.88	D
Modesto (MOD)	56,016	5,601	7,200	0.76	C	65,734	6,573	7,200	0.91	E
Merced (MCE)	2,551	255	2,000	0.11	A	6,100	610	2,000	0.31	A
Fresno (FYI)	12,448	1,244	6,000	0.17	A	22,366	2,237	6,000	0.37	A
Visalia (VIS)	67,774	6,778	16,500	0.36	A	140,439	14,045	22,500	0.62	B
Bakersfield (BFL)	26,767	2,677	8,000	0.33	A	86,759	8,680	8,000	1.09	F

Figure 10 Airport Area Level of Service: Existing 2002 vs. Baseline 2020

4.1.4 Public Transit

The only known change in airport transit conditions is at SMF. Current plans are to link the airport with the downtown area via an alignment known as the Downtown/Natoma/Airport (DNA) Light Rail Line. This will significantly improve access with high frequency headways of high capacity light rail vehicles to the airport.

Detailed discussions of public transit available in the future are contained in the Modal and HST Alternative sections.

4.1.5 Future Goods Movement Issues

Critical goods movement corridors with existing congestion were previously identified in Section 2.4. The SJVGM Study, which identified most of these critical corridors, also recommended a Phase II study entailing, among other tasks, goods movement forecasts. No interim reports developed for the Phase II study were available as of February 2003.

In the absence of the Phase II San Joaquin Goods Movement model, it was assumed that the principal goods movement bottlenecks (as shown on **FIGURE 8**) would continue to be those truck routes with significant existing congestion. Based on recent trends, it appears likely that congested conditions will worsen as the population and level of goods movement in the Valley increases.

4.1.6 Parking

Detailed parking discussions for the airport locations are presented in Section 4.2.7, and at the station areas in Section 4.3.7.

4.2 MODAL ALTERNATIVE

4.2.1 Trip Generation by Airport

Under the Modal Alternative, air travel is anticipated to increase as a result of travel induced by the HST. Based on data provided by Kaku Associates of the HST Program Management Team, it is estimated that, independent of potential induced population growth or induced development, travel induced by the availability of a high-speed train is approximately 6 percent of HST estimated ridership. Of this 6 percent, approximately 63 percent would divert to air travel if high-speed trains were not constructed. Additional air travelers induced by high-speed trains are estimated to arrive at designated airports by the modes shown in **TABLE 10**.

TABLE 10
Induced Airport Travel Mode Choice

	Air	Rail	Bus/ Shuttle	Taxi	Self	Drop-off	Ped
Sacramento (SMF)	0%	10%	20%	15%	25%	30%	0%
Modesto (MOD)	0%	0%	20%	10%	40%	30%	0%
Merced (MCE)	0%	0%	15%	5%	50%	30%	0%
Fresno (FYI)	0%	0%	20%	10%	40%	30%	0%
Visalia (VIS)	0%	0%	10%	5%	55%	30%	0%
Bakersfield (BFL)	0%	0%	20%	10%	40%	30%	0%

Based on the number of passengers and their mode choice, induced trip generation estimates to the airports were calculated and are shown in **TABLE 11**. In order to present a conservative analysis, the number of outbound passengers is equal to the number of inbound passengers. Detailed airport trip generation is presented in Appendix B.

TABLE 11
Induced Airport Travel - AM Peak Hour

		INBOUND					OUTBOUND					
	Induced Passengers	Bus/ Shuttle	Taxi	Self	Drop-off	Total	Bus/ Shuttle	Taxi	Self	Drop-off	Total	TOTAL
Sacramento (SMF)	56	1	3	7	18	29	1	3	7	18	29	**58**
Modesto (MOD)	6	0	0	1	2	3	0	0	1	2	3	**6**
Merced (MCE)	2	0	0	1	1	2	0	0	1	1	2	**4**
Fresno (FYI)	13	0	1	3	4	8	0	1	3	4	8	**16**
Visalia (VIS)	1	0	0	0	1	1	0	0	0	1	1	**2**
Bakersfield (BFL)	14	0	1	3	4	8	0	1	3	4	8	**16**

4.2.2 Trip Distribution to/from Airports

Trip distribution to/from each station and trip assignment to individual streets considered future traffic projections on each facility that comprises the cordon. To produce a conservative evaluation of impacts, all trips generated by a station or airport were assumed to cross its surrounding cordon, rather than be captured at destinations within the cordon or intercepted from already-passing traffic. Along each cordon, additional trips were distributed to individual street segments and station access modes in proportion to the distribution of baseline volumes to reduce the subjectivity of assigning trips to specific facilities.

4.2.3 Roadway Impacts

4.2.3.1 Airport Area Roadway Impacts

The travel estimates were added to the roadways that serve the airports as shown in **TABLE 12** and summarized on **Figure 11**. Induced HST travel would not worsen the level of service to any of the airport areas; however, the access roadway to BFL would operate at LOS F and require widening of the airport access roadway from four to six lanes to provide adequate service levels to the airport.

TABLE 12
Induced Air Travel - Airport Impacts

	2020 No-Project					2020 Modal Alternative				
	ADT	Peak Hour Traffic	Capacity	V/C	LOS	Induced Demand	Peak Hour Traffic	Capacity	V/C	LOS
Sacramento (SMF)	31,772	3,180	3,600	0.88	D	58	3,238	3,600	0.90	D
Modesto (MOD)	65,734	6,573	7,200	0.91	E	6	6,579	7,200	0.91	E
Merced (MCE)	6,100	610	2,000	0.31	A	4	614	2,000	0.31	A
Fresno (FYI)	22,366	2,237	6,000	0.37	A	16	2,253	6,000	0.38	A
Visalia (VIS)	140,439	14,045	22,500	0.62	B	2	14,047	22,500	0.62	B
Bakersfield (BFL)	86,759	8,680	8,000	1.09	F	16	8,696	8,000	1.09	F

Figure 11 Airport Area Level of Service: Baseline 2020 vs. Modal Alternative

No station areas currently operating within capacity constraints would operate above capacity with induced air travel. The one airport area projected to operate above capacity (BFL) would continue to do so with induced air travel.

4.2.3.2 Modal Alternative Intercity Impact Analysis

In this scenario, a small amount of induced HST traffic is converted to vehicular traffic and added to the intercity links. The total induced highway traffic is equal to 37 percent of the 6 percent of overall induced HST ridership in the corridor (2.2 percent of total ridership). The conversion factors result in a very small increment of vehicular traffic. Thus, the volumes in this scenario are very similar to the 2020 No-Project scenario.

The incremental traffic increases for the Modal Alternative are assumed to be split 60-40 by direction on the intercity links, with 60 percent of added peak hour in the heavier direction at each intercity highway link.

TABLE 13 lists specific screenline facilities and 2020 V/C ratios for the 2020 No-Project and 2020 Modal Alternatives. For the Modal Alternative, the effect of additional mainline lanes on intercity segments was calculated at locations where the impact analysis indicated a "high" or "medium" level of impact (i.e., a V/C ratio of over 1.0, LOS F). These additional lanes that would bring the level of service to LOS E or better on all screenlines are considered an integral part of the Modal Alternative.

These widenings are beyond what is indicated in the RTP fiscally constrained improvements. In some instances, RTPs have identified a second tier of desirable improvements for which funding cannot be identified. Some of the widenings applied to the Modal Alternative are listed in the relevant RTPs as "Tier II" improvements. The final column of **TABLE 13** indicates additional lanes called for as part of Tier II improvements based on available RTP documents. Four of the screenline studies would require widening that goes beyond the Tier II improvements.

Although widening is feasible for I-5 outside of the Sacramento region, the greatest benefits would arise through the widening of SR 99. SR 99 is the "main street" for the corridor, serving the majority of the downtown areas and other major activity centers in the Valley's largest cities. Though the RTPs call for SR 99 to have six lanes through the corridor by 2025, widening beyond this would require expensive taking of real property and pose significant economic, social, and environmental issues for the communities. Consequently, even where physically feasible, widening beyond six lanes would be expensive and controversial. The Modal Alternative would require 8 to 10 lanes on SR 99 over much of its length, and would therefore incur many of these negative consequences.

Figures E-7, E-8, and **E-9** in Appendix E show the results of the intercity screenline analysis for the Modal Alternative in comparison to No-Project 2020 conditions.

4.2.4 Public Transit Impacts

Minimal public transit impacts would occur under the Modal Alternative. Increases in transit ridership attributed to the Modal Alternative are less than three new peak riders at each airport area, except at SMF, where transit ridership could increase by up to 11 AM peak hour passengers.

TABLE 13
Modal Alternative - Screenline Level of Service
AM Peak Hour

		2020 NO-PROJECT			MODAL ALTERNATIVE			
Highway	Specific Screenline Link	Future RTP # Lanes	V/C	LOS	Added Traffic	Added Lanes	V/C	LOS
I-80	Yolo Causeway	4	1.15	F	4	1	0.92	E
I-5	Between Hood Franklin Rd & Elk Grove Blvd	2	1.53	F	3	1	1.02	F
	North of J11 to Sacramento/San Joaquin Co. line	2	1.30	F	3	1	0.87	D
	North of 1-205 & 1-5 jct.	5	0.87	D	4	1	0.73	C
	South of I-580	2	0.96	E	7	1	0.64	B
	Between Whitworth Rd & SR 33	2	0.67	B	7	1	0.45	A
	Between SR 165 & Merced/Fresno Co. line	2	0.61	B	8	1	0.41	A
	Between SR 33 & SR 145	2	0.66	B	8	1	0.44	A
	Between Buttonwillow Rowlee & Lerdo Hwy	2	0.78	C	8	1	0.52	A
	Between SR 166 & SR 99	2	0.67	B	8	1	0.45	A
SR 99	Between Mack Rd & Florin Rd	3	1.51	F	1	1	0.98	E
	Between Collier Rd & Liberty Rd	2	1.01	F	1	1	0.58	A
	Between Ripon Rd & San Joaquin/Stanislaus Co. line	3	1.40	F	2	1	0.91	E
	Between Hammett Rd & San Joaquin/Stanislaus Co. line	3	1.57	F	2	1	1.02	F
	South of Mitchell Rd	3	0.84	D	2	1	0.55	A
	Between Bloss & Robin (west of Livingston)	3	0.39	A	2	1	0.35	A
	Sandy Mush Rd. to Merced/Madera Co. line	2	0.56	A	2	1	0.32	A
	Herndon Ave to Madera/Fresno Co. line	3	0.69	B	2	1	0.45	A
	Between Adams Ave & Clovis Ave	3	1.03	F	2	1	0.67	B
	Between Ave 384 & Tulare/Fresno Co. line	3	0.61	B	2	1	0.40	A
	North of 7th Standard Rd	3	0.74	C	2	1	0.48	A
	Between SR 119 & Houghton Rd	3	0.73	C	2	1	0.48	A

4.2.5 Goods Movement Impacts

Since the Modal Alternative consists in part of expanding highways in the corridor, it would have a beneficial effect on goods movement along the principal parallel highways (I-5 and SR 99). While no negative goods movement impacts would occur under this alternative as compared to the No-Project 2020 conditions on major highways, such a major investment in highway facilities could increase the dominance of trucking for goods movement in the corridor. Therefore, increases in goods movement congestion on local roads and at freight terminals could result under the Modal Alternative.

4.2.6 Parking Impacts and Issues

Added parking demand for each airport with induced travel diverted from high-speed trains is shown in **TABLE 14.**

TABLE 14
Airport Area
Additional Loading Zone and Parking Requirements

	Peak Hour Loading Requirements[1]			Self Park[2]
Airport	**Bus/Shuttle**	**Taxi**	**Drop-off**	**Parking Spaces**
Sacramento (SMF)	0	0	2	110
Modesto (MOD)	0	0	0	20
Merced (MCE)	0	0	0	8
Fresno (FYI)	0	0	0	42
Visalia (VIS)	0	0	0	3
Bakersfield (BFL)	0	0	0	32

Notes:
1. Loading Zone Spaces = Daily Boardings X % Passengers in Peak Hour / Average Number of Passengers per Vehicle / (60 min/ hr Headway) X Length of Stay Factor X Airport Mode Split (63%) X Induced Demand Factor (6%).
2. Self Parking Spaces = Daily Boarding / Avg # of Passengers Per Vehicle X Length of Stay Factor X Airport Mode Split (63%) X Induced Demand Factor (6%).

Sacramento International Airport

There are currently over 12,000 public parking spaces in five parking lots at SMF. A 4,300 space parking structure is currently under construction with anticipated completion for 2004. With the addition of induced travel from high-speed train, an increase in parking demand of up to 110 spaces could be expected.

Modesto City-County Airport

Information provided in the *Modesto City-County Airport Master Plan* indicates that existing long-term parking supplies are sufficient to accommodate up to 45,000 annual enplanements (currently 22,000). However, current short-term, rental car, and employee parking supplies are insufficient to accommodate expected future demand. The Airport Master Plan estimates that an additional 18 short-term, 18 rental car, and 5 employee parking spaces would be required by 2022. With the addition of induced travel from high-speed train, MOD could expect an increase in parking demand of up to 20 spaces.

Merced Municipal Airport

Sixty parking spaces are currently available at the MCE. Based on the *1990 Airport Master Plan*, the major elements of the airfield (i.e., runway, parallel taxiway, and main apron) are expected to meet user needs for the next 20 years. Although there are no plans for airfield expansion, improvements to the terminal building would be required to meet expected peak passenger demand by 2010. With an expanded terminal building, the *1990 Airport Master Plan* estimates a total of 250 parking spaces would be needed to accommodate passenger and employee demand. Induced travel from high-speed train could result in an increased parking space demand of up to 8 spaces.

Fresno Yosemite International Airport

The *Airport Master Plan* is currently under way for FYI, with anticipated completion by 2004. The intent of the Master Plan is to define the appropriate expansion scale for aircraft operations. Identified in the 2001

RTP prepared by the Council of Fresno County Governments, expanded parking facilities would be required to meet increased demand. Construction on new parking supplies within the terminal access loop began in 2001. Additional increases in the number of public and employee spaces would be addressed as enplanement levels increase. With the addition of induced travel from high-speed train, an increase in parking demand of up to 42 spaces could be expected.

Visalia Municipal Airport

The 2001 *Airport Master Plan* for the VIS states the amount of parking currently available (approximately 120 spaces) is sufficient to accommodate future demand. Induced travel from high-speed train could result in a parking demand increase of up to 3 spaces.

Bakersfield Meadows Field Kern County Airport

Approximately 300 spaces are currently provided at BFL. An additional 32 parking spaces could be required at the airport with induced demand from high-speed trains.

4.3 HIGH-SPEED TRAIN ALTERNATIVE

4.3.1 Trip Generation by Rail Station

Trip generation for each station area was developed by evaluating the number of projected high-speed train trips in the applicable region. Data provided by Kaku Associates of the HST Program Management Team estimated the station access mode choice. **TABLE 15** provides trip generation estimates for each station area. In order to present a conservative analysis, the number of outbound passengers is equal to the number of inbound passengers.

The mode choice and expected peak hour boarding and alightings were utilized to estimate rip generation for each station locations, as shown in **TABLE 16**. Detailed trip generation worksheets are provided in Appendix B.

TABLE 15
High-Speed Train Ridership and Mode Choice

	Peak Hour	Mode						
						Auto		
	Boardings/ Alightings	Air	Rail	Bus/ Shuttle	Taxi	Self	Drop -off	Ped
Sacramento - Downtown	1,475	0%	10%	20%	15%	15%	30%	10%
Sacramento - Power Inn	1,475	0%	0%	30%	15%	25%	30%	0%
Stockton - Downtown	188	0%	5%	15%	10%	35%	30%	5%
Modesto - Downtown	169	0%	5%	15%	10%	35%	30%	5%
Modesto – Briggsmore	169	0%	0%	20%	10%	40%	30%	0%
Merced - Downtown	51	0%	5%	15%	10%	35%	30%	5%
Merced - Suburban	51	0%	0%	15%	5%	50%	30%	0%
Fresno - Downtown	355	0%	5%	15%	10%	35%	30%	5%
Visalia / Hanford	16	0%	0%	10%	5%	50%	30%	5%
Bakersfield - Downtown	374	0%	5%	15%	10%	35%	30%	5%
Bakersfield - Suburban	374	0%	0%	20%	10%	40%	30%	0%

TABLE 16
High-Speed Train Trip Generation

	Inbound					Outbound					
	Bus/ Shuttle	Taxi	Self	Drop-off	Sub-Total	Bus/ Shuttle	Taxi	Self	Drop-off	Sub-Total	Total
Sacramento - Downtown	21	89	116	466	692	21	89	116	466	692	1,384
Sacramento - Power Inn	32	89	194	466	780	32	89	194	466	780	1,560
Stockton - Downtown	2	8	35	59	104	2	8	35	59	104	208
Modesto - Downtown	2	7	31	53	93	2	7	31	53	93	186
Modesto – Briggsmore	2	7	35	53	98	2	7	35	53	98	196
Merced - Downtown	1	2	9	16	28	1	2	9	16	28	56
Merced - Suburban	1	1	14	16	31	1	1	14	16	31	62
Fresno - Downtown	4	14	65	112	195	4	14	65	112	195	390
Visalia / Hanford	0	0	4	5	9	0	0	4	5	9	18
Bakersfield - Downtown	4	15	69	118	206	4	15	69	118	206	412
Bakersfield – Suburban	5	15	79	118	217	5	15	79	118	217	434

4.3.2 Trip Distribution to/from Rail Station

Trip distribution to/from each station and trip assignment to individual streets considered future traffic projections on each facility that comprises the cordon. To produce a conservative evaluation of impacts, all trips generated by a station or airport were assumed to cross its surrounding cordon, rather than be captured at destinations within the cordon or intercepted from already-passing traffic. Along each cordon, additional trips were distributed to individual street segments and station access modes in proportion to the distribution of baseline volumes to reduce the subjectivity of assigning trips to specific facilities.

4.3.3 Roadway Impacts

4.3.3.1 Station Area Roadway Cordon Impacts

The travel estimates were added to the roadways that serve the stations as shown in **TABLE 17**. Traffic generated by High-Speed Train would not worsen the level of service to any of the stations areas. A summary of the station area roadway conditions is shown on **Figure 12**.

With the addition of traffic to/from the HST stations, the overall cordon level of service would not change around any station area. However, service levels on several specific roadway links would degrade with the addition of traffic to the HST stations, as discussed below.

TABLE 17
Station Cordon Summary
2020 Conditions – AM Peak Hour With High-Speed Train

	No-Project (2020)					2020 With High-Speed Train				
Station Location	ADT	Peak Hour Traffic	Capacity	V/C	LOS	Project Traffic	Peak Hour Traffic	Capacity	V/C	LOS
Sacramento-Downtown	623,512	62,340	72,200	0.86	D	1,384	63,724	72,200	0.88	D
Sacramento-Power Inn	231,729	23,160	29,200	0.79	C	1,560	24,720	29,200	0.85	D
Stockton-Downtown	450,449	45,040	73,300	0.61	B	208	45,248	73,300	0.62	B
Modesto-Briggsmore	136,614	13,660	21,300	0.64	B	196	13,856	21,300	0.65	B
Modesto-Downtown	163,432	16,340	25,000	0.65	B	186	16,526	25,000	0.66	B
Merced-Castle AFB	78,079	7,808	14,800	0.53	A	62	7,870	14,800	0.53	A
Merced-Airport	20,101	2,010	5,500	0.37	A	62	2,072	5,500	0.38	A
Merced-Downtown	328,478	32,848	34,000	0.97	E	56	32,904	34,000	0.97	E
Fresno-Downtown	370,554	37,055	68,200	0.54	A	390	37,445	68,200	0.55	A
Hanford-Downtown	169,240	19,199	30,400	0.63	B	18	19,217	30,400	0.63	B
Visalia	296,245	29,630	46,400	0.64	B	18	29,648	46,400	0.64	B
Bakersfield-Golden State	258,299	25,830	28,140	0.92	E	412	26,242	28,140	0.93	E
Bakersfield-Truxtun	226,045	22,610	34,000	0.67	B	412	23,022	34,000	0.68	B
Bakersfield-Airport	340,792	34,070	40,660	0.84	D	434	34,504	40,660	0.85	D

Figure 12 Station Area Level of Service: Baseline 2020 vs. with High Speed Train

Sacramento

Downtown

High-speed traffic impacts would be minor. With the addition of HST traffic, the cordon surrounding the station area would continue to operate at LOS D. Additionally, high-speed train traffic would worsen the service level on any roadway segment in the analysis cordon. However, the V/C on several roadways projected to operate at either close to capacity or over-capacity conditions (i.e., LOS E or LOS F, respectively) would increase. These roadways include SR 99/I-5; C Street, west of SR 99/I-5; J Street, east of 10th Street; and 9th Street, south of L Street.

Power Inn Road

The cordon surrounding the Power Inn Road station would operate at LOS D with the addition of traffic from the high-speed train. Although the area as a whole would operate acceptably, the level of service on Power Inn Road, north of Lemon Hill, would worsen from LOS E to LOS F. Conditions on Florin Perkins would also degrade from LOS B to LOS C. The projected LOS F conditions on 14th Avenue and Power Inn Road would also worsen with HST traffic.

Stockton

Operations on the roadways previously identified to operate at deficient levels of service will degrade slightly with the addition of project traffic. The addition of high-speed train traffic would not worsen the level of service on any of the study segments and the cordon would continue to operate at LOS B.

Modesto

Downtown

The downtown Modesto area cordon will continue to operate at LOS B, even with the development of a high-speed train station. No roadway segment impacts are anticipated.

Briggsmore

As discussed above for 2020 No-Project conditions, one roadway (Church Street, south of Parker Avenue) is projected to operate at a deficient level of service near the suburban Modesto station. The addition of HST traffic would also result in LOS F conditions on Claus Road to the south of East Briggsmore Road. Overall, the cordon surrounding the station area would operate at LOS B.

Merced

Municipal Airport

The cordon would continue to operate at LOS A. All study roadways within the vicinity of the airport are projected to operate at LOS C or better, with most roadways operating at LOS A, even with the addition of the high-speed train station.

Castle AFB

All study roadways within the vicinity of Castle AFB are projected to operate at LOS D or better, with most roadways operating at LOS A with the addition of the high-speed train station. The cordon would continue to operate at LOS A.

Downtown

Roadways projected to operate at LOS F by 2020 include R, M, and 16th Streets. HST traffic will increase congestion on these roadways, but will not degrade the level of service on any segment in the cordon. The overall cordon would continue to operate at LOS E.

Fresno

All study roadways within the vicinity of the Fresno downtown station are projected to operate at LOS D or better, with most roadways operating at an overall service level of LOS A with the addition of HST traffic. Although all roadways are projected to operate at acceptable levels of service with addition of HST traffic, four east-west roadways (Divisadero, Kern, and Mono Streets, and East Florence Avenue) are proposed to be closed at the rail right-of-way. These roadways provide local access across the tracks, and do not provide a regional east-west connection over the rail lines. The cordon overall would continue to operate at LOS A.

Hanford

AM peak hour traffic to the Hanford high-speed train station is expected to be negligible, with the overall area level of service remaining at LOS A.

Visalia

Roadways surrounding the Visalia station are proposed to operate an on overall service level of LOS B, with no individual roadway segments operating below LOS C. High-speed train traffic would not alter or change the overall level of service on any individual roadway segment in the cordon.

Bakersfield

Airport

Roadway facilities around the BFL station are projected to operate at an overall (cordon) level of service of LOS D; however, portions of SR 65, Seventh Standard Road, Norris Road, and SR 99 are projected to operate at LOS E or LOS F. These conditions would continue with the development of the high-speed train in the vicinity of the airport.

Golden State

Segments of SR 204 are projected to operate at LOS F during the AM peak hour. Surface streets in the vicinity of the station area are projected to operate at LOS C or better. The addition of HST traffic would not alter the level of service on any of the roadway segments. The cordon would continue to operate at LOS E.

Truxtun

Overall, the roadways surrounding the Truxtun station area are projected to operate at LOS B with the addition of HST traffic. Union Avenue, south of California Avenue, would continue to operate at LOS E during the AM peak hour with the high-speed train. The cordon would operate at LOS B with or without HST.

4.3.4 Intercity Highway Impacts

All roadway and background traffic assumptions described for the No-Project scenario (Section 4.1.1.3) were maintained for the HST Alternative.

Since the HST project is expected to draw a substantial proportion (37 percent) of its passengers from intercity auto trips, volumes in 2020 are reduced compared to the No-Project scenario. The number of AM peak trips removed from the intercity highway network in the Corridor was calculated using data provided by Kaku Associates of the HST Program Management Team via the "*Modal Alternative Highway Component*" spreadsheet. **TABLE 18** lists key assumptions used to calculate these reductions for each intercity link.

TABLE 18
High-Speed Train Conversion Factors

Factors Used to Convert HST Ridership to Intercity Vehicular Traffic	
Auto Occupancy	2.40 per Auto
Daily Factor	1/365 of Annual Ridership
Peak Hour Factor	0.07
Induced Highway Traffic	2.2 percent

Source: Kaku Associates

Traffic reductions as noted in Section 4.2.1.3 are assumed to be split 60-40, with 60 percent of peak hour reductions occurring in the heavier direction at each intercity highway link. The results of the intercity screenline analysis are presented in **Table 19. Figures E-10, E-11**, and **E-12** in Appendix E provide intercity screenline analysis results for the HST Alternative in comparison to No-Project 2020 conditions. Additionally, the level of service would improve on several segments of I-5 and SR 99 with high-speed train, (i.e., from LOS E to LOS D on I-5, south of I-580).

More significant than highway congestion relief, the HST Alternative represents an additional, and novel form, of access and travel capacity for travel between cities in the Valley and to/from Southern California and the Bay Area. The Sacramento-Bakersfield corridor is the fastest growing section of California, a fact noted in each RTP. The RTPs also note that this rapid population is accompanied by increasing demand for transportation connections to the coastal metropolitan areas, as employment in agriculture declines and the Valley's economic linkages to the coastal regions become more numerous and vital. The RTPs universally recognize the impracticality of an entirely auto-based transportation system with the growth of the San Joaquin Valley.

By providing a high-speed, congestion-free, and reliable link to the major coastal regions and economies, high-speed trains would provide a needed transportation backbone for the Valley's ongoing growth and development. Furthermore, HST would not be subject to any highway congestion, whether caused by excess demand, highway accidents, or weather. This is a substantial benefit in a region where highways are frequently subject to delays and dangerous driving conditions due to fog and dust storms exist.

TABLE 19
Intercity Screenline Impacts With High-Speed Train
AM Peak Hour

		2020 No-Project				2020 With High-Speed Train	
Highway	Screenline	Lanes	V/C	LOS	Change in Traffic	V/C	LOS
I-80	Yolo Causeway	4	1.15	F	-167	1.13	F
I-5	Between Hood Franklin Rd & Elk Grove Blvd	2	1.53	F	-129	1.50	F
	North of J11 to Sacramento/San Joaquin Co. line	2	1.30	F	-129	1.28	F
	North of 1-205 & 1-5 jct.	5	0.87	D	-162	0.86	D
	South of I-580	2	0.96	E	-295	0.89	D
	Between Whitworth Rd & SR 33	2	0.67	B	-295	0.60	A
	Between SR 165 & Merced/Fresno Co. line	2	0.61	B	-349	0.53	A
	Between SR 33 & SR 145	2	0.66	B	-349	0.58	A
	Between Buttonwillow Rowlee & Lerdo Hwy	2	0.78	C	-349	0.70	B
	Between SR 166 & SR 99	2	0.67	B	-349	0.60	A
SR 99	Between Mack Rd & Florin Rd	3	1.51	F	-31	1.50	F
	Between Collier Rd & Liberty Rd	2	1.01	F	-31	1.00	E
	Between Ripon Rd & San Joaquin/Stanislaus Co. line	3	1.40	F	-98	1.38	F
	Between Hammett Rd & San Joaquin/Stanislaus Co. line	3	1.57	F	-98	1.55	F
	South of Mitchell Rd	3	0.84	D	-96	0.83	D
	Between Bloss & Robin (west of Livingston)	3	0.39	A	-96	0.37	A
	Sandy Mush Rd. to Merced/Madera Co. line	2	0.56	A	-89	0.53	A
	Herndon Ave to Madera/Fresno Co. line	3	0.69	B	-94	0.68	B
	Between Adams Ave & Clovis Ave	3	1.03	F	-90	1.02	F
	Between Ave 384 & Tulare/Fresno Co. line	3	0.61	B	-90	0.59	A
	North of 7th Standard Rd	3	0.74	C	-89	0.72	C
	Between SR 119 & Houghton Rd	3	0.73	C	-116	0.71	C

Note: Lanes per direction

4.3.5 Future 2020 Airport Area Conditions With High-Speed Train

Air travel diverted to high-speed train would result in reduced traffic in airport areas. As shown in **TABLE 20** and summarized on **FIGURE 13**, providing high-speed train service would improve the level of service on access roadways to SMF from LOS D to LOS B, and would improve service levels on the access roadway to MOD from LOS E to LOS D. However, as in the No-Project and Modal Alternatives, the access roadway to BFL would need to be widened to six lanes to provide acceptable levels of service to the airport.

TABLE 20
High-Speed Train
Airport Impacts – AM Peak Hour

	2020 No-Project					2020 With High-Speed Train				
	ADT	Peak Hour Traffic	Capacity	V/C	LOS	Reduced Demand	Peak Hour Traffic	Capacity	V/C	LOS
Sacramento (SMF)	31,772	3,180	3,600	0.88	D	-908	2,272	3,600	0.63	B
Modesto (MOD)	65,734	6,573	7,200	0.91	E	-114	6,459	7,200	0.90	D
Merced (MCE)	6,100	610	2,000	0.31	A	-38	572	2,000	0.29	A
Fresno (FYI)	22,366	2,237	6,000	0.37	A	-252	1,995	6,000	0.33	A
Visalia (VIS)	140,439	14,045	22,500	0.62	B	-12	14,033	22,500	0.62	B
Bakersfield (BFL)	86,759	8,680	8,000	1.09	F	-256	8,424	8,000	1.05	F

4.3.6 Public Transit Impacts by Screenline or Cordon

Based on discussions in the RTPs, financial constraints are a concern of all transit operators in the region, with some more impacted than others. There will need to be new allocations of transit services to the proposed station areas. Some rerouting and rescheduling of local buses to optimize connections is warranted throughout the corridor. In some locations, the hours of the day over which bus services operate may need to be extended.

Generally the new demand generated by high-speed trains will not create a demand for significant new route miles except at the busiest station (Sacramento). Bakersfield, with the highest number of high-speed trains in the AM peak hour, may need to deploy additional peak service. FAX transit may also require additional services since current operations are overburdened at certain routes during peak periods.

In calculating future transit needs in station areas, two calculations were made.

- The first estimates the number of buses needed assuming 40 passengers per bus (i.e., a standard size bus, fully loaded with no standees).
- The second, which forms the basis of the vehicular traffic impact analysis, assumes more typical passenger loads and a 50-50 split between full-size buses and smaller, airport shuttles. This calculation results in an average of 14 riders per bus/shuttle vehicle (i.e., 20 passengers per bus and 7 passengers per shuttle).

Figure 13 Airport Area Level of Service: Baseline 2020 vs. with High Speed Train

Sacramento

Downtown

The Sacramento Area Council of Governments (SACOG) plans a major upgrade to current transit facilities. Light rail expansion is already underway with extensions being built to link the current system and south Sacramento with the proposed high-speed train station at the Amtrak Depot. Further extensions are planned to West Sacramento and the airport. This would double light rail capacity in the vicinity of the station. In addition, SACOG plans to increase the bus fleet by 110 percent. Commuter Rail between the cities of Dixon and Auburn, with a stop at the proposed HST Station at the Amtrak Depot, is also planned. The Capitol Corridor commuter service is also programmed for increases in service. In total, the enhanced transit services should be sufficient to handle the projected 295 AM peak hour transit users. These users will require the equivalent of 8 full passenger buses or 21 shuttles in the AM peak hour. Transit service may also need to be expanded into the early morning and late night hours to correspond with the high-speed train schedule as the first train departs and the last train arrives outside the current system operating hours.

Power Inn Road

Projected transit service is currently not programmed to handle the projected 295 AM peak hour transit users. These users will require the equivalent of 8 full passenger buses or 21 shuttles in the AM peak hour. Significant rerouting of local transit services will be required. This site does not provide for a good connection with Amtrak or the airport for inter-regional transfers, and is not within walking distance of the nearest light rail station. Transit service may also need to be expanded into the early morning and late night hours to correspond with the high-speed train schedule as the first train departs and the last train arrives outside of the current system operating hours.

Stockton

The proposed Stockton station is adjacent to many transit services. The future should see increased service pursuant to the San Joaquin Council of Governments 2001 RTP (p. 4-11): "*Improved and expanded urban, intercity, and interregional bus services, which coordinate and integrate with new and improved passenger rail services are included in this transit investment strategy…".* Projections indicate 28 AM peak transit users. These users will require the equivalent of one full passenger bus or two shuttles in the AM peak hour. Transit service may also need to be expanded into the early morning and late night hours to correspond with the high-speed train schedule as the first train departs and the last train arrives outside of the current system operating hours.

Modesto

The Stanislaus Council of Governments (StanCOG) projects a 37.5 percent increase in the number of buses (from 48 to 66), and the total number of fixed routes will rise 41 percent (from 32 to 45) for area transit systems (StanCOG 2001 RTP, pp. 5-6). The HST project will generate 25 AM peak transit users. These users will require the equivalent of one passenger bus (3/5 full) or two shuttles in the AM peak hour. Transit service may also need to be expanded into the late night hours to correspond with the high-speed train schedule as the first train departs and the last train arrives outside of the current system operating hours.

Downtown

Transit provisions should be more than sufficient to serve the projected demand. This site does not provide a direct connection with Amtrak.

Briggsmore

Transit provisions should be sufficient to serve the projected demand. Some rerouting to provide direct service may be required to serve high-speed train demand.

Merced

According to the Merced County Association of Governments (MACOG) 2001 RTP (p. 38), increased transit usage and service is planned. There are projections of seven AM peak transit users for any of the proposed Merced stations. These users will require less than one full passenger bus or a single shuttle in the AM peak hour. Transit service may also need to be expanded into the high-speed train schedule as the first train departs and the last train arrives outside of the current system operating hours.

Municipal Airport

The lower level of transit access at the airport appears sufficient for the low transit demand projections for the Merced station. Any increase in growth will likely require additional services. This site does not provide a direct connection with Amtrak.

Downtown

The downtown station area is the transit hub for Merced; as such, this area has more than sufficient capacity to handle projections and growth in demand.

Castle AFB

The current level of transit access at this site, though low, appears sufficient given the low projected number of bus/shuttle riders to and from the Merced station. Any increase in growth will likely require additional transit services. This site does not provide a direct connection with Amtrak or the airport for inter-regional transfers.

Fresno

Fresno will continue with funding constraints through 2020. Currently, FAX transit provides 10 percent fewer revenue service miles than in 1980, not fully meeting the present need. The FAX budget is expected to double by 2020. Given the anticipated population increase of 93 percent for the Fresno-Clovis Metropolitan Area, these increases in funding will be insufficient to meet future demand (FresnoCOG 2001 RTP, pp.4-36, 4-39, 4-40).

The HST Alternative will generate a projected 53 AM peak transit users. These users will require the equivalent of two full passenger buses or four shuttles in the AM peak hour. The planned level of transit access will remain sufficient for the low projections for the Fresno station. Any increase in growth will likely require additional allocation of resources. Current transit operating hours would be sufficient to serve all trains.

Hanford

Kings County assumes growth in transit usage and the areas it serves through 2020, although no specific funding or service enhancements have been identified. The Hanford Intermodal Station (the proposed HST station site) is already the focus of major transit activity and will remain so. The RTP indicates that Kings County residents utilize train services to a higher degree than other Valley counties (Kings County 2001 RTP, p. 6-1). There are two projected AM peak transit users, and transit provisions should be sufficient to serve this projected demand. Transit service may also need to be expanded into the high-

speed train schedule as the first train departs and the last train arrives outside of the current system operating hours.

Visalia

Based on the Tulare County Regional Transportation Plan (p.4-27), transit services are expected to increase slightly to serve anticipated growth in the region. With the addition of high-speed train service, two additional AM peak transit users are projected. These users could easily be accommodated by the transit system as configured. This site does not provide a direct connection with Amtrak. Transit service may also need to be expanded into the high-speed train schedule as the first train departs and the last train arrives outside of the current system operating hours.

Bakersfield

Kern County is expected to grow by 50 percent by 2010. Increased and coordinated services, the creation of a transit center, and a direct connection with the Amtrak Station are identified as major goals. The number one issue is limited transit dollars (Kern County 2000 RTP p1-3) and the uncertainty imposed by fiscal constraints. Transit service may also need to be expanded into the high-speed train schedule as the first train departs and the last train arrives outside of the current system operating hours.

Airport

There are 75 projected AM peak transit users. These users will require the equivalent of two full passenger buses or six shuttles in the AM peak hour. This site does not provide a direct connection with Amtrak. Local transit resources are inadequate, and greater frequency of service is required.

Golden State

There are 75 projected AM peak transit users. These users will require the equivalent of two full passenger buses or six shuttles in the AM peak hour. Local transit resources are adequate, but will require enhancements given any increase in demand.

Truxtun

There are 56 projected AM peak transit users. These users will require the equivalent of two full passenger buses or four shuttles in the AM peak hour. Although current transit resources are adequate, implementation of the direct transit link with Amtrak (also located at this site) would improve access,.

4.3.7 Goods Movement Impacts

For all but one of the critical intercity freight routes identified above and shown on **FIGURE 8**, the traffic analysis indicates a slight but beneficial project impact. In other words, with the exception of I-5 (which is co-designated SR 99 near the proposed downtown Sacramento station), the intercity traffic relief afforded by the HST project would be greater than the new vehicular traffic attracted to the station areas. Even for the I-5 segment, the added traffic would represent only a fraction of a percent of total traffic.
At other locations, the percentage (though not the number) of trucks would rise somewhat as a result of the HST project, since virtually all vehicles removed would be passenger cars and not trucks.

Many of the alignment options will require temporary or permanent relocation of existing freight tracks. This may have short-term adverse impacts to freight operations, which can be minimized via construction staging. Where the alignment is immediately adjacent to existing freight rail corridors, there is a potential to constrain new industry access to rail line, but existing freight movement will not be affected. All high-speed train alignments have been designed to avoid existing rail yards and connections, therefore, no

permanent disruption of freight operations should result. (Source: Email from Rachel Vandenberg, DMJM+HARRIS, January 22, 2003)

Portions of the various HST Alternative alignment options run alongside existing freight rail corridors (i.e., Union Pacific and Burlington Northern Santa Fe railroads) that presently include a series of at-grade crossings. While it is not the goal of the HST project to grade-separate parallel freight lines, existing freight railroads would also be grade-separated where the high-speed train alignment is immediately adjacent to an existing railroad, and an underpass is proposed to separate an existing roadway (roadway under railroad). Depending on the final configuration of the HST Alternative, high-speed train grade-separations could also result in the elimination of additional existing at-grade crossings if an overpass (i.e., roadway over high-speed train) configuration is selected at various locations.

In general, the HST Alternative would bring substantial traffic benefits for rail and truck freight and vehicular traffic at the numerous locations where high-speed trains will be grade-separated. As many as 258 locations adjacent to conventional rail tracks will be grade-separated from roadway traffic. Each of these grade separations would decrease conflicts between rail and highway traffic, thereby improving the efficiency and safety of both modes. The exact number of locations in which crossing roadways will be grade-separated from rail tracks is dependent on the final specific alignments chosen for high-speed trains in the corridor. **TABLE 21** summarizes the potential number of grade separations for each alignment for each intercity segment of the corridor.

4.3.8 Parking Impacts and Issues

Parking demand at each station location was estimated using ridership forecasts and passenger mode choice, as shown in **TABLE 22**. Sufficient parking supplies to meet demand would be constructed at all proposed HST stations.

Sacramento

Downtown

The downtown Sacramento area would need to provide an additional 1,747 long-term parking spaces to support projected high-speed train ridership. As an existing parking shortage has been identified for the downtown area, parking supplies sufficient to accommodate anticipated demand would be constructed with the HST station. The City of Sacramento is undertaking a major planning effort to revaluate and redesign the rail yard area. This planning effort could change land uses, general circulation, and parking supplies in the area; however, as plans have not been approved, the ultimate extent of changes to the downtown area are unknown at this time.

Power Inn Road

The Power Inn Road station would require approximately 2,911 long-term parking spaces. Limited public parking is provided within this station area. Parking supplies sufficient to accommodate demand would be constructed with the station option at this location.

TABLE 21
Potential Elimination of Existing At-Grade Crossings

HST Alignment Option (See Appendix F for plan and profiles of alignment options)	Proposed Underpasses that Grade-Separate Existing RR Crossings	Potential Grade Separations of Existing RR Crossings Resulting from Possible Roadway Overpasses of HST
Sacramento to Stockton		
Option A1	11	36
Option A2	6	25
Option A3	7	27
Option A4	2	22
Option A5	11	31
Option A6	6	25
Option A7	7	22
Option A8	2	16
Stockton to Modesto		
Option B1	0	9
Option B2	4	14
Modesto to Merced		
Option C1	16	16
Option C2	16	16
Option C3	15	14
Option C4	15	14
Option C5	21	35
Option C6	21	35
Option C7	20	33
Option C8	20	33
Option C9	5	11
Option C10	5	11
Option C11	12	32
Option C12	12	32
Option C13	12	32
Option C14	21	35
Option C15	12	32
Option C16	20	33
Merced to Fresno		
Option D1	22	21
Option D2	22	21
Option D3	23	11
Option D4	23	11
Option D5	18	17
Option D6	18	17
Option D7	17	27
Option D8	17	27

TABLE 21 (CONT.)
Potential Elimination of Existing At-Grade Crossings

HST Alignment Option (See Appendix F for plan and profiles of alignment options)	Proposed Underpasses that Grade-Separate Existing RR Crossings	Potential Grade Separations of Existing RR Crossings Resulting from Possible Roadway Overpasses of HST
Fresno to Tulare		
Option E1	8	18
Option E2	1	17
Tulare to Bakersfield		
Option F1	15	20
Option F2	9	20
Option F3	14	16
Option F4	8	16
Option F5	12	35
Option F6	6	35
Option F7	15	20
Option F8	9	20
Option F9	14	16
Option F10	8	16
Option F11	12	35
Option F12	6	35
Option F13	7	19
Option F14	6	15
Option F15	14	25
Option F16	8	25
Option F17	13	11
Option F18	7	11
Option F19	15	20
Option F20	9	20
Option F21	14	16
Option F22	8	16
Option F23	11	56
Option F24	5	56

(Source: Email and tabular data from Rachel Vandenberg, DMJM+HARRIS, 4/7/03)

TABLE 22
Station Area Loading Zone and Parking Requirements

Station Location	Peak Hour Loading Requirements[1]			Self Park[2]
	Bus/Shuttle	Taxi	Drop-off	Parking Spaces
Sacramento - Downtown	6	13	45	1,747
Sacramento - Power Inn	9	13	45	2,911
Stockton - Downtown	1	1	6	519
Modesto - Downtown	1	1	5	466
Modesto - Briggsmore	1	1	5	532
Merced - Downtown	0	0	2	142
Merced - Suburban	0	0	2	203
Fresno - Downtown	1	2	11	980
Visalia or Hanford	0	0	0	62
Bakersfield - Downtown	1	2	8	739
Bakersfield - Suburban	1	2	8	844

Notes:
1. Loading Zone Spaces = Daily Boardings X % Passengers in Peak Hour / Average Number of Passengers per Vehicle / (60 min/hr / Headway) X Length of Stay Factor.
2. Self Parking Spaces = Daily Boarding / Avg # of Passengers Per Vehicle X Length of Stay Factor.

Stockton

Future parking development in the downtown Stockton area has been identified as a need in the *Downtown Stockton Strategic Plan*. With construction of a high-speed train station, long-term parking in the area would increase by approximately 519 spaces. Although new structures are proposed in the vicinity of the station area, additional parking supplies would be constructed with the HST station to serve this demand.

Modesto

Additional parking supplies are currently proposed for the downtown Modesto area. With construction of a high-speed train station in this area, long-term parking demand would increase by about 466 spaces. Sufficient parking would be constructed as a part of the HST project to serve increased demand. The construction of a station at the suburban location would increase parking demand to about 532 spaces.

Merced

Based on expected ridership from the Merced area, 142 downtown or 203 suburban parking spaces would be required to accommodate the expected increase in demand. These spaces would be constructed with the development of an HST station. The Merced County RTP identifies the provision of park-and-ride lots to support the development of an HST station in the Merced area.

Fresno

The city of Fresno is seeking methods to provide more convenient downtown parking. New electronic parking meters were installed in late 2002 at over 800 on-street spaces in the downtown area. Additional parking areas have also recently been constructed to meet demand from the new Fresno Stadium. An additional 980 parking spaces would be required in the station area to accommodate projected high-speed train ridership in Fresno. These spaces would be constructed as part of the HST project.

Hanford

Policies to *"provide adequate parking and loading facilities while encouraging alternative means of transportation"* are presented in Hanford's *General Plan Update 2002*. The General Plan also identifies policies to encourage transit and carpooling by establishing park-and-ride lots near highly traveled commute routes and encouraging the development of shared parking facilities. With the construction of an HST station in downtown Hanford, at least 62 long-term parking spaces would be required. The required amount of spaces would be constructed as a part of the HST project.

Visalia

The City of Visalia developed a *Downtown Visalia Parking Management Plan* in 1990 to identify existing and future parking supply and demand. This Plan identified parking management strategies, such as time limits, enforcement, additional parking supplies, parking permits, and parking development standards. No parking management plans are available for the station area.

The proposed HST station area is located adjacent to VIS, where nearby parcels are currently undeveloped. It is anticipated that with the construction of an HST station at this location, at least 62 long-term parking spaces would be constructed as a part of the HST project.

Bakersfield

Parking strategies for the downtown Bakersfield area have been identified through the *Vision 2020* process, as documented in the *Downtown Design Charrette* (May 11-17, 2001). These strategies include the establishment of a parking authority, consolidation of structured parking, and ordinances and other elements to improve the parking supply in the downtown Bakersfield area. With the construction of an HST station in downtown Bakersfield, approximately 739 additional parking spaces would be required to accommodate the anticipated demand. Sufficient parking to accommodate anticipated demand would be constructed as part of the project. With construction of the station at the BFL area, at least 844 parking spaces would be needed to accommodate the demand. Sufficient parking to accommodate anticipated demand would be constructed as a part of the HST project.

5.0 PREPARERS

Jerry Walters Principal	Master of Engineering (Transportation) Rensselaer Polytechnic Institute, 1974; 30 Years of Experience • Overall project direction and coordination
Richard Lee Senior Transportation Planner	Ph.D., City and Regional Planning, University of California, Berkeley, 1995, M.S. Civil Engineering, 1984; 20 Years of Experience • Project coordinator; intercity, goods movement and transit analyses
Kathrin Lenck Transportation Planner	Master of Arts in Urban Planning, University of California, Los Angeles, 2000; 5 Years of Experience • Station area and airport area analyses.
Jay Stagi Planner	B.A., Geography and Urban Studies, San Francisco State University, 2000; 3 Years of Experience • Intercity and transit analysis; GIS graphics
Michele Martinez Project Assistant	A.A., English/Liberal Studies, Santa Ana College, 1984. • Technical editing, document proofing, and quality control/quality assurance

6.0 SOURCES OF DATA/INFORMATION

6.1 REGIONAL TRANSPORTATION PLANS (RTPS)

Council of Fresno County Governments (FresnoCOG). *Regional Transportation Plan*. Adopted on November 29, 2001.

Kern County Council of Governments (KernCOG). *2000 Regional Transportation Plan*. "Executive Summary". September 2000.

KernCOG. *Kings County Regional Transportation Plan*. December 2001.

Merced County Association of Governments (MCAG). *Regional Transportation Plan*. July 2001.

San Joaquin Council of Governments (SJCOG). Destination 2025. *2001 Regional Transportation Plan*.

Sacramento Council of Governments (SACOG). *Metropolitan Transportation Plan for 2025*. Final Draft, May 15, 2002. (SACOG-02-009).

SACOG. *A Bold First Step for Mobility in the Sacramento Region: Metropolitan Transportation Plan for 2025*. 2001. [SACOG-02-019}.

Stanislaus Council of Governments (StanCOG). *Regional Transportation Plan*. "Investment Strategies for the Future" 2000 - 2025. Adopted February 13, 2002.

Tulare County Association of Governments (TCAG). *2001/2002 Regional Transportation Plan*. July 16, 2001. 14th Edition.

6.2 GENERAL PLANS

City of Sacramento. *City of Sacramento General Plan, Circulation Element*. (provided by EIP).

City of Sacramento. *City 2005 Downtown Sacramento Redevelopment Strategy*. City of Sacramento Economic Development Department. February 2002.

City of Stockton. *Downtown Strategic Action Plan. City of Stockton*. October 2001.

City of Stockton. *DEIR City of Stockton 1992 General Plan Revision*. Michael Paoli and Associates. August 1992

City of Modesto. *DEIR Update for the Urban Area General Plan and Related Amendments to the Urban Area General Plan*. City of Modesto Community and Economic Development Department. 2002

City of Merced. *Merced Vision 2015 Final Program EIR*. City of Merced. April 1997.

City of Fresno. *2025 Fresno General Plan*. Planning and Development Dept. Advance Planning. 2002.

City of Fresno. *Draft Master EIR for the 2025 Fresno General Plan*. URS Corp. 2002.

City of Visalia. *Circulation Element Update. City of Visalia*. April 2001.

City of Hanford. *General Plan Update 2002*. Valley Planning Consultants Inc. Adopted June 18, 2002.

City of Bakersfield. *Metropolitan Bakersfield General Plan Update EIR*. June 2002.

6.3 RTP Travel Demand Models

2000/2025 SacMet (Sacramento Metropolitan Area Council of Governments) Model
1999/2025 SJCOG (San Joaquin County Council of Governments) Model
2000/2025 STANCOG (Stanislaus County Council of Governments) Model
2000/2025 MCAG (Merced County Association of Governments) Model
1998/2025 Fresno COG (Fresno County Council of Governments) Model
1998/2020 TCAG (Tulare County Association of Governments) Model
1998/2025 Kern County Model

6.4 Airport Master Plans

Modesto City-County Airport. *Airport Master Plan 2002*. Coffman Associates. 2002.

Merced Municipal Airport Master Plan Report, Prepared for City of Merced by Hodges & Shutt, December 1990.

Visalia Municipal Airport Master Plan, Prepared for City of Visalia by Shutt Moen Associates, March 26, 2001.

6.5 Websites

(all websites last accessed on February 13, 2003)

6.5.1 City Information

http://www.cityofsacramento.org/
http://www.stocktongov.com/
http://www.ci.modesto.ca.us/
http://ci.merced.ca.us/
http://www.ci.hanford.ca.us/
http://www.ci.visalia.ca.us/
http://www.ci.fresno.ca.us/
http://www.ci.bakersfield.ca.us/
http://www.downtownsac.org/view_map.html
http://www.downtownstockton.org/docs/pdf/cpd_lots.pdf
http://www.modestogov.com/gis/mapIndex.cfm?x=b
http://www.sacsites.com/online_library/pdfs/implmnt_dtsac_2005_full.pdf
http://www.ci.fresno.ca.us/map/parking/index.html
http://www.ci.fresno.ca.us/news%26info/release%5F120502.html

6.5.2 Counties

http://www.saccounty.net/
http://www.co.san-joaquin.ca.us/
http://www.co.stanislaus.ca.us/
http://www.co.merced.ca.us/
http://www.countyofkings.com/
http://www.co.tulare.ca.us/
http://www.co.fresno.ca.us/portal/
http://www.co.kern.ca.us/
http://www.sacog.org

6.5.3 Airports

http://www.sacairports.org/beac1102.htm#one
http://www.sacairports.org/Passenger%20Service/Parking.html
http://www.modairport.com/default.asp
http://www.modairport.com/pass.htm#public%20parking
http://www.mercedrides.com/Airport/MercedMunicipal.htm
http://www.flyvisalia.com/customamenities.htm
http://www.flyfresno.org/ground.asp
http://www.meadowsfield.com/GroundTransportation.htm (Bakersfield Airport)

6.5.4 Transit Agencies

http://www.amtrak.com/destinations/california.html
http://www.greyhound.com
http://www.sacrt.com (Sacramento)
http://www.acerail.com/ (Altamont Commuter Express)
http://www.sj-smart.com (San Joaquin County/Stockton)
http://www.modestoareaexpress.com/
http://www.srt.org/index.html (Stanislaus Regional Transit)
http://www.mercedrides.com/ (Merced)
http://www.ci.fresno.ca.us/fax/index.html
http://www.ci.visalia.ca.us/busroute.htm
http://www.countyofkings.com/main/KART2.pdf (Hanford)
http://www.orangebelt.com (Orange Belt Stages)
http://www.getbus.org (Bakersfield)

6.5.5 Traffic Data from Caltrans

http://www.dot.ca.gov/hq/traffops/saferesr/trafdata/2001all.htm
http://www.dot.ca.gov/hq/traffops/saferesr/trafdata/2001all.htm

APPENDICES

APPENDIX A

Station Area and Airport Area Graphics

Insert Figures A-1 through A-20

APPENDIX B

Station and Airport Area Trip Generation

APPENDIX C
Station Area Traffic Impact Details

APPENDIX D
Airport Area Traffic Impact Details

APPENDIX E
Intercity Traffic Impact Details

INSERT APPENDIX TABLES E-1 *THROUGH* **E- 12 HERE**

APPENDIX F

Corridor and Design Options for High-Speed Train Alternative

CORRIDOR AND DESIGN OPTIONS FOR HIGH-SPEED TRAIN ALTERNATIVE

SACRAMENTO TO BAKERSFIELD

Corridor Definition

The Central Valley region has been divided into six discrete corridors:

Corridor A, Sacramento to Stockton

Corridor B, Stockton to Modesto

Corridor C, Modesto to Merced

Corridor D, Merced to Fresno

Corridor E, Fresno to Tulare

Corridor F, Tulare to Bakersfield

Design Options

There are two or more HST alignment alternatives within each Corridor, distinguished by parallel route (UPRR or BNSF), station site served, route connection (UPRR or BNSF) to the south, and station configuration (off-line "loop" or standard). HST alternatives are shown on the alignment exhibits in this Appendix.

Within the Sacramento to Bakersfield region, the HST project would be built primarily at-grade. With the exception of specific and localized grade separations, which may include structures to carry the HST alignment over existing roadway or railroad facilities, proposed aerial structures within the Central Valley would include those listed below. The specific location, number, and length of structures will be determined during the next phase of design.

Aerial Structure Locations			
HST Alignment Option(s)	**Aerial Structure Location**	**Approximate Limits**	**Length (ft)**
Corridor A			
Sacramento Depot alignments: A1 thru A4	Sacramento	Sacramento Downtown Depot to the Elvas Wye	17,000
Sacramento Depot alignments parallel to UPRR north of Stockton: A1, A3	Sacramento	Folsom Blvd to 14th Avenue	6,000
All alignments: A1 thru A8	Stockton	Harding Way to Mormon Slough	7,000
Corridor B			
Modesto Downtown Station alignment: B1	Modesto	Kansas Avenue to Tuolumne River	9,000
Modesto Briggsmore Station alignment: B2	Escalon	Yosemite Avenue to St. John Road	5,000
Modesto Briggsmore Station alignment: B2	Riverbank	South of Patterson Road to Claribel Road	7,000
Corridor C			
All alignments parallel to UPRR north of Merced: C1, C2, C3, C4, C9, C10	Turlock	Broadway to Berkeley Avenue	12,000

Aerial Structure Locations			
HST Alignment Option(s)	**Aerial Structure Location**	**Approximate Limits**	**Length (ft)**
All alignments parallel to UPRR north of Merced: C1, C2, C3, C4, C9, C10	South of Delhi	High Fine Canal to Merced River	8,000
All alignments parallel to UPRR north of Merced: C1, C2, C3, C4, C9, C10	Atwater	Atwater Canal/Jordan Canal to SR99 Overpass	13,000
Corridor D			
All alignments parallel to UPRR north of Fresno: D5, D6, D7, D8	Madera	Fresno River to Olive Avenue	8,000
All alignments: D1 thru D8	Fresno	Ashlan Avenue to Clinton Avenue	12,000
All alignments: D1 thru D8	Fresno	Belmont Avenue to SR180 Overpass	4,000
Corridor E			
Visalia Airport Station alignment: E1	Selma	Floral Avenue to Nebraska Avenue	8,000
Hanford Station alignment: E2	Hanford	11th Avenue to south of 3rd Street	6,000
Corridor F			
All alignments thru Tulare: F1, F2, F7, F8, F13, F15, F16, F19, F20	Tulare	Prosperity Avenue/Avenue 240 to Bardsley Avenue	11,000
All alignments parallel to UPRR north of Bakersfield: F1 thru F4, F7 thru F10, F13 thru F22	Delano	Cecil Avenue to High Street	8,000
All alignments parallel to BNSF north of Bakersfield: F5, F6, F11, F12, F23, F24	Corcoran	Orange Avenue to Pickerell Avenue	6,000
All alignments parallel to BNSF north of Bakersfield: F5, F6, F11, F12, F23, F24	Shafter	Tulare Avenue to Lerdo Highway	4,000
Truxtun (Amtrak) Station (without loop) alignments parallel to UPRR north of Bakersfield: F15 thru F18	Famoso	North of Poso Creek to south of SR99	16,000
Bakersfield Airport Station, Golden State Station, Truxtun (Union Avenue) Station, and Truxtun (Amtrak) Station (with high-speed loop) alignments: F1 thru F6, F7 thru F12 F13, F14, F19 thru F22	Bakersfield	North of Norris Road to Olive Drive	6,000
Bakersfield Airport Station, Golden State Station, Truxtun (Union Avenue) Station, and Truxtun (Amtrak) Station (with high-speed loop) alignments: F1 thru F6, F7 thru F12 F13, F14, F19 thru F22	Bakersfield	Beale Avenue to Mount Vernon Avenue	7,000
Truxtun (Amtrak) Station alignments: F15 thru F24	Bakersfield	North of Mohawk Street to Carrier Canal	8,000
Truxtun (Amtrak) Station alignments: F15 thru F24	Bakersfield	F Street to Truxtun Avenue	14,000

See Report "Sacramento to Bakersfield High Speed Alignment Option Segments"